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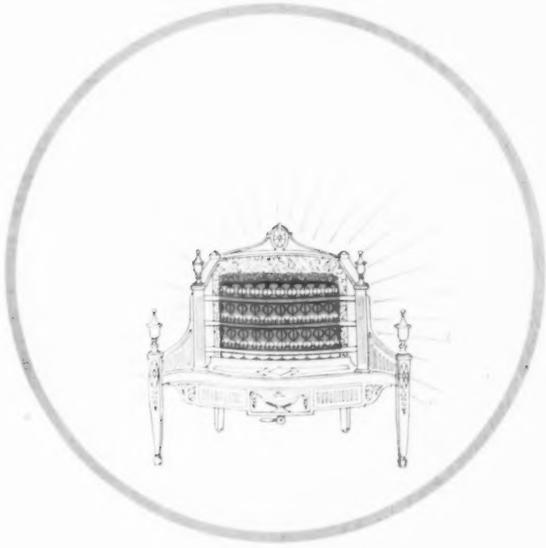

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INDEX TO CONTENTS, PAGE 4 ADVERTISERS' INDEX, PAGE 61

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American Gas Journal

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Vol. CXV, No. 20 NEW YORK, NOVEMBER 12, 1921 Whole No. 3323

Optimism Keynote of Third Annual A. G. A. Convention

Attendance Breaks Records at Huge Gathering in Chicago

From the very outset a spirit of optimism and enthusiasm held sway at the third annual meeting of the American Gas Association, held last week at the Hotel Congress, Chicago. It was a most successful meeting from every standpoint, and the attendance was the greatest ever. No association convention in the history of the gas industry accomplished as much as took place at Chicago. It was freely predicted by all in attendance that the gas industry had received an impetus that would carry it through the coming year in a way that would sweep all obstacles before it. There were over 1,600 men present when the first general session was held.

The reports of the various committees showed that the association had accomplished a great deal during the past year, and plans were made for even wider activities during the coming twelvemonth.

The different sectional meetings which filled each afternoon also provided much food for thought and were well attended. The discussions which took place showed how greatly the various subjects of the papers appealed to the men charged with the responsibility of supplying gas to the millions of people of the United States, and from the entire convention there radiated a determination to fight through the battles that are confronting the industry.

That the association is widening its scope of influence was shown in the fact that during the past year thirty-nine gas companies, one holding company, fifty manufacturers and three hundred and fourteen individuals had been admitted to membership. It was commented on by Charles A. Munroe, the retiring president, that the growth, while not great, was normal, and showed that the industry is rallying to the support of the association, which, it is expected, will in a few years have as members 100 per cent of the industry.

Outstanding features of the convention:

Optimism proves keynote.

Next meeting at Atlantic City, N. J., or New York City.

Attendance records broken.

Exhibitors report unusual amount of orders.

The treasurer's report also was a matter of congratulation, as it showed that during the year the association had prospered and is to-day in its strongest financial position.

The time-and-place committee recommended that the convention next year be held either at Atlantic City, N. J., or New York City, in the month of October. This appealed greatly to those present and a final decision undoubtedly will be forthcoming soon.

Each of the different sectional meetings were well attended, and the enthusiasm which featured the general meetings was also present. The papers were fully discussed, and the ideas advanced proved of real service

A feature that added to the convention was the president's reception on Wednesday evening. This occasion always a feature of the conventions, was well attended and proved a brilliant affair.

The banquet of Thursday evening also served to increase the enthusiasm of those present.

The New Officers

Dana D. Barnum, vice-president and chief engineer of the Boston (Mass.) Consolidated Gas Company, was elected president, succeeding Mr. Munroe, vice-president of the Peoples Gas Light & Coke Company, of Chicago, Ill.

R. B. Brown, vice-president of the Milwaukee (Wis.) Gas Light Company, was elected vice-president, and Harry M. Brundage, secretary of the Consolidated Gas Company, New York, treasurer.

Members of the executive board elected to serve two years were: George M. Cortelyou president Consolidated Gas Company, New York; M. B. Daly, president East Ohio Gas Company, Cleveland, Ohio; C. H. Dickey, president American Meter Company, New York; C. L. Holman, president Laclede Gas Light Company, St. Louis, Mo.; A. H. Hewitt, general manager Consumers Gas Company, Toronto,

Canada; F. H. Knapp, vice-president Pittsburgh (Pa.) Water Heater Company; A. B. Macbeth, vice-president Southern California Gas Company, Los Angeles, Cal.; J. B. Klumpp, assistant general manager United Gas Improvement Company, Philadelphia, Pa.

Appointment of a commission of eminent physiologists to make an exhaustive research, with a view of adopting a national plan for life-saving, was announced by President Munroe.

On the findings of the commission it is proposed that a definite plan of education will be carried on in every gas company in the United States with a view of making every employee capable of rendering first aid in all cases involving gas asphyxiation, electrification or drowning. It is hoped that a plan can be adopted so that not only the men in the plants but every employee meeting the public, including meter men and repair men, will be able to take care of any case until a physician can be obtained.

The personnel of the commission is: Dr. Cecil K. Drinker (chairman), associate professor of applied physiology, Harvard Medical School; Dr. David L. Edsall, dean of Harvard Medical School and professor of clinical medicine; Dr. Walter B. Cannon, professor of physiology, Harvard Medical School; Dr. H. W. Haggard, instructor in physiology, Yale University; Dr. Lawrence J. Henderson, professor of biological chemistry, Harvard University; Dr. Yandell Henderson, professor of physiology, Yale University; Dr. W. K. Lewis, professor of chemical engineering, Massachusetts Institute of Technology; Charles B. Scott, Bureau of Safety, Chicago.

"The association hopes that as a result of the study of this commission it will be able to adopt a system of resuscitation that can be taught to every employee, whether in the plants or meeting the public, so that they will be able to efficiently render first aid," Mr. Munroe said. "In taking this commendable step for conservation of life and the welfare of the public, the gas association manifests an interest devoid of material gain and makes use of its influence in a contribution to the public good. The association, the medical profession and the public will look forward with much interest to the recommendations of this commission."

Phillips Makes Important Report

Perhaps there was nothing that created greater interest and discussion than the report which Alfred I. Phillips, gas engineer of the American Gas Association, made to the managing committee. Mr. Phillips has just returned from a trip to England in which he made an investigation of conditions in the gas industry over there. Mr. Phillips proved a close observer, and much of the report which he made will prove of great value to gas companies generally in connection with calorific values.

"England learned during the war that a great portion of the heat in gas went into the atmosphere a sheer waste," said Mr. Phillips. "The result is that fixed standards of heat have been abolished. Instead, the gas company declares the calorific value of the gas it intends to deliver, and the householder or industrial user pays on that basis. Waste, either in production or in the money the user pays, is reduced to the minimum.

"The effect of this freedom of action will be far-reaching. Developments in manufacture are being made which are impossible under our burdensome, obsolete and unscientific restrictions. Several single-stage processes for completely gasifying coal have been developed. Steaming of retorts is a proved success in England. With either of these processes a low heating value gas is produced. On the other hand, a few companies in England, because of special local conditions, find it economical to produce gas of 500 to 550 B.t.u. This is a high heat value for England, though comparatively low for this country.

Sends Out 485 B.t.u. Gas

"The Gas Light & Coke Company of London, the oldest and now the largest single gas company in the world, is sending out a gas of about 485 B.t.u. Some undertakings are supplying gas of only slightly over 400 heat units and apparently giving an entirely satisfactory service, while at least one company has a standard of only about 250 heat units. Standards as low as the latter, however, are not yet a proven success.

"Prior to the war the heating value standards of England were practically the same as in this country. England made its discovery regarding heat values when, under war pressure, it became necessary to extract certain constituents for the manufacture of picric acid, T.N.T. and other explosives, which brought about a material reduction in heating standards. In this respect Lord Moulton says that the materials furnished by the English undertakings for the making of such explosives saved the Allies from defeat in the early days of the war. As the war went on the quality of coal depreciated, gas oil became difficult to obtain, transportation difficulties increased, and, because of lack of men and materials to make repairs, plants were in no condition to operate with the efficiencies normally obtained. Further reductions in heating value became imperative."

During the railroad and miners' strikes following the war, standards of 450 B.t.u., and even lower, were fixed by the Board of Trade under the Defense of the Realm Act, Mr. Phillips said During this time, he explained, the British Fuel Research Board, under the leadership of Sir George Beilby, was requested to make a study of gas standards and report to the board. The latter, after receiving the report, made a finding that it "would not be to the ultimate advantage of any of the interests concerned that any one fixed standard of composition and calorific value be prescribed." Resultant from this investigation, he said, there was incorporated in the Gas Regulation Act a provision that gas be charged for on a heat basis and that "each gas undertaking declare the calorific value of the gas it intends to deliver, making the necessary adjustment of appliances to insure safety and efficiency." Under this act standards of from 550 B.t.u. have been declared.

"Until American standards are made more modern and inflexible regulations done away with, any considerable progress will be prevented," Mr. Phillips said. "The gas industry in the United States should have far more liberty to develop and adopt new and improved manufacturing processes such as will result in economy, if the best interests of the people are to

(*Continued on page* 442.)

Munroe Sees Prosperous Times Ahead

Retiring President of A. G. A. Holds Out Great Hope for Future of Industry

By CHARLES A. MUNROE

The American Gas Association held its organization meeting in the City of New York in June, 1918. It was organized to promote and develop the gas industry and to co-ordinate activities to the end that it might serve to the fullest possible extent the best interest of the public. At the time of its organization the world had been at war for four years. Each of these years, as one succeeded another, brought problems more difficult than its predecessor, finally culminating in 1920, the darkest year the industry has ever seen.

But the great distress of our industry was the blending force which brought all of its elements together, and now as we emerge into a world of peace we see that the terrible strain of those days has accomplished one great thing—it humbled every man in this business. Every one became desirous of cooperating with every one else, in order to remedy conditions which were threatening the very life of the business. During this period our Association was fortunate in having as its president a gentleman of great distinction, who endeared himself to all those who worked with him, and who eliminated any possibility of jealousy among the member companies. For how could such unworthy feelings exist in the face of such unselfishness and high purpose as he showed on every occasion! I refer to the Honorable George B. Cortelyou.

Gasmen Agree on Fundamentals

It is indeed gratifying, as was brought out at the Atlantic City conference, that we have come to a unanimity of opinion on the general character of rate structures. This has been a subject of earnest discussion among gasmen for many years, and to-day I think I can safely say that there is not a single fundamental policy of our business on which there is disagreement.

Taxation Problems

This association was among the first in the country to appreciate the harmful effect which flows from tax-exempt securities, estimated to amount to as much as ten billion dollars. It was the hope of your association that it would be possible to point out to the country and to Congress that the securities of public utility companies in the hands of holders should in all fairness be on a parity for the purposes of taxation with the securities issued under State authority. We have made substantial progress in arousing a public sentiment throughout the length and breadth of the land against tax-free securities, and it is our earnest hope that the time may soon come when all securities will be on a parity for the purpose of taxation.

Your association is co-operating with the National Electric Light Association and the American Electric Railway Association, and as a result of this co-operation a committee on Federal taxation representing the public utility interests of the country, has been created. That committee has been active in presenting the views of your association to the Ways and Means Committee of the House and the Finance Committee of the Senate. This committee is also urging the adoption of Senator Smoot's bill providing a sales tax, and is also keeping close watch upon the development of the 1921 revenue law, with the hope of eliminating from this law provisions which would be harmful to our industry.

Effectual protest against the inclusion in the Fordney tariff bill of a tax on Mexican oil was made by the gas oil committee of the association. It is believed that this Government could not with propriety levy an import tax on oil and at the same time protest against an export tax levied by the Mexican Government.

Calorific Standards Should Be Modified

Throughout the year the association has had occasion to assist in the elimination of candle-power standards from the requirements of city ordinances and State commissions. It is to be hoped that the withdrawal of the obsolete candle-power standard will be shortly followed by a modification downward of the high calorific standards which now prevail. It can be demonstrated that a gas with a calorific standard of 300 B. t.u. is capable of doing all of the work which can be done with a gas of a higher calorific value, and in the main such a gas can be used with greater efficiency, due to the smaller quantity of air required to complete combustion. It would seem self-evident that there should be no calorific value required higher than can be produced from the most economical fuels and under the most modern processes of manufacture. With the increasing demand for oil, the importance of lower calorific values is emphasized. As a conservative measure to preserve the oil resources of the nation, there should be a general lowering of the B.t.u. standard.

In order that this association might be thoroughly posted on the workings of a decreased calorific standard, especially in England, we dispatched our engineer, Mr. Phillips, to study the situation there and to report. There will be available to the membership of this association the results of his study.

The Gas Company Telling Its Story

When the period of losing money came, relief in the way of increased rates had to be secured if the utilities were to survive. In the past year your association has been active in telling the public the story of the gas company through its literature and through its assistance in organizing committees on public utility information in the various States. We have tried to make the public realize that its great public utility institutions were in danger of destruction, owing to

increased costs of delivering the service, unless compensatory increases in rates were granted, and further that the comfort and prosperity of each community is inseparably linked with the welfare of these utilities. We believe that the people understand to-day, as they never understood before, the fundamental economics underlying our business.

As evidence of the better understanding by the public of our business and the fairness of treatment which follows this understanding, a notable instance may be mentioned. The Chicago Association of Commerce, representing the business men of this community, appeared before the Public Utilities Commission of the State and urged that the Commission increase the rate of the railway companies, the telephone company and the gas company. This action of the Association of Commerce was based upon the conviction that the public begins to lose, or actually loses, the conveniences they should have when they exact rates for service which are below the operating cost, including a fair return on the investment, and furthermore that it does not necessarily follow that taking away something from a public utility is for the public good.

We must continue the work until the public realizes that a public utility property is devoted to the service of the whole public and that its interests are thoroughly safeguarded when the operation of a utility is regulated by competent men chosen by their elected representatives. Public utility service is no longer a luxury to be enjoyed by the wealthy, but rather is a necessity for the comfort and convenience of all the people, and therefore if all the people must have this service it is self-evident that the people must pay sufficient for the service to enable the utilities to carry on.

Fair Gas Rates Must Be Continued

At the present time a difficult task confronts us—one which we can only meet through education of the public. Prices for all commodities have had a decided drop, and it is only natural that the people, through their representatives, should inquire when the price of our gas is to be reduced. We must point out to our consumers that a considerable period elapsed between the time that commodity prices began to rise in value and the time that we received relief through increased rates. Some of the delay in receiving increased rates is chargeable to the management of the companies, many of whom hesitated to ask for the increase in rates in the hope that the increased commodity cost was temporary and would soon return to normal. Again there was a long delay between the application for the increase and the order putting it into effect—with the result that during this delay inventories and working capital were used up, and maintenance work deferred. When the public understands that during the past years you have been unable to earn sufficient to pay your operating expenses and taxes and a reasonable return on the value of your property devoted to the public use, they are going to permit you, in all fairness, to make up, through your rate, any deficits thus incurred.

Selling Securities to Customers

Article 2 of the constitution of our association deals with the purposes for which it was formed. Section 4 reads as follows: "To conserve and encourage investment in the gas industry." We know that our industry stands at the threshold of an era of great prosperity and useful service. Therefore, each company should have no hesitancy in undertaking to sell its junior securities to its customers. The money obtainable in this way is as cheap as it can be secured from any source, and besides we should do our share toward the education of the public in the fundamentals of the public utility business. This education can be accomplished in no more thorough and effective manner than through the sale to our customers of our securities.

Technical Training Should Be Encouraged

This association must continue the work of pointing out to the universities and technical schools of the country the demand which exists for men fully prepared to enter the gas business. During the year the University of Michigan has adopted and now is offering a full three-year course in gas engineering, and if our industry is to go forward, and achieve the most which the business is capable of doing, it must have pouring into it every year a large number of technically trained, fully prepared gas engineers.

Employees' Representation.

In the coming year we should give attention to the question of employees' representation, and those companies which have not looked into the benefits to be derived from the adoption of such a plan can well afford to do so. The individual to-day is entitled to receive fair treatment from his superior, and such plans of employees' representation afford an orderly method for the disposition of any grievances to the mutual advantage of the individual and the company.

The Exhibit

We are particularly indebted to the manufacturers' section for the splendid exhibit which it has provided at this convention, and it should be the duty of every one of our members to acquaint themselves with the appliances offered.

Geographical Consideration as Affecting Membership

Notwithstanding the very gratifying membership growth which this association has enjoyed in the past year, there are a number of companies remotely situated, notably on the Pacific Coast, which are not members of the association and which, because of their location and consequent inability to have their employees participate in the work of the association, feel that they should have the benefits of a membership, but should not pay as much in the way of dues as do those companies whose representatives are more active in the work. They should be members for our common good, and it should be possible to find some equitable adjustment of dues so that they will become members.

(*Continued on page* 449.)

Seen and Heard in the Corridors

Sidelights on the Convention That Impressed an Observer

The first place that the gasmen headed for when they arrived at the Congress Hotel, where the third annual convention of the American Gas Association was held was the exhibit room. On the street floor of the hotel, in the Elizabethan room, was part of the exhibit where numerous appliances and a great deal of equipment in operation were on display, while on the second floor in the Florentine room were other booths which attracted attention. On corridors on either side of the Florentine room numerous smaller rooms had been thrown open to the gasmen and in these, too, there were displays. Taken all in all, the exhibit was splendidly handled and Percy H. Hall, assistant secretary-manager of the association, is to be congratulated. He seemed to be at all places at the same time and was ever ready to help out.

One of the first gasmen to appear on the scene was Carl B. Wyckoff, general manager of the Emporia Gas Company, Emporia, Kan. Mr. Wyckoff presented a paper (which was printed in these columns several weeks ago) that attracted a lot of attention and was very favorably commented upon. There can be no doubt that Mr. Wyckoff has accomplished wonders in the time that he has been in charge of the company and one of the leaders of the industry declared unqualifiedly that he believes that Mr. Wyckoff had done much not only for the people of Emporia and the company that serves them but also for the industry as a whole. Mr. Wyckoff radiates enthusiasm and "pep" and after a short conversation with him any one would be convinced that the gas business is the only one for a red-blooded man to be in.

The year of 1922 will see the greatest number of appliances sales that have ever been made, declared A. G. Schanze, sales manager of the Scott Gas Appliance Company, who was constantly the center of a group of men. "I have been spending the last several weeks on the road and I want to say that the improvement that I have noted in business has been marvelous. In the West, New England, the South; in fact, in all parts of the country business has been improving during these past few weeks in wonderful shape. Confidence has been restored in those who were more or less timid and I want to say that I have absolutely no doubt of what 1922 holds. And after the disarmament conference has completed its work, and we all know that it will end by seeing an end to all wars, then a wave of prosperity will sweep over the world such as has never before been seen. I want to say, too, that my remarks are not based on hope but on what actually is happening."

There was an air of confidence about Sherman Fay, of the Western Gas Construction Company, Fort Wayne, Ind., when he spoke of the future. Mr. Fay has just completed a trip to the coast and has closely observed conditions. In his estimation, he asserted, the era of prosperity which we have all been hoping for is not on its way but is here already. His sentiments were echoed by practically every man at the convention. By January 1, Mr. Fay stated, he expected that progress would be back to normal.

Every official of the A. G. A. who had anything to do with the convention certainly did his level best to make things run smoothly. It was unfortunate, however, that the employees of the hotel were not schooled in politeness. Their attitude toward many of the men who formed part of the convention was insolent and the desk clerks did not waste any time on guests of the hotel but seemed to be busy holding conferences among themselves. They did their best to defeat the best efforts of the efficient staff of the association. Next year it is to be hoped that such conditions will not exist.

John F. Smith, secretary and sales manager of the Superior Meter Company, Brooklyn, helped brighten up the Florentine room with his genial smile. Rarely indeed does Mr. Smith lose that smile of his. Incidently we heard that he signed an application for membership in Nemsag. Who are the members? and What's it all about? were questions that were heard on all sides. Mr. Smith did not vouchsafe any information.

Those who took in both parts of the exhibit several times a day declared that they were training for a Marathon race. But it wasn't noticeable that anybody lost flesh.

George W. Allen, the secretary-treasurer of the Canadian Gas Association and editor of the *Intercolonial Gas Journal of Canada*, was unable to be present at the convention. There was illness in Mr. Allen's family and he was held at home. He was greatly missed. J. B. McNary, who took his place, however, proved a splendid representative of the Dominion forces.

Jim Conroy, of New York and Minnetonka, says he has a lot of folks back there in Wisconsin. In fact, Jim says that he digs up new ones every week.

According to word that became known around the corridors, Harry Abels, of the American Light & Traction Company, has just joined the Electric Bond & Share Company, as vice-president. The good wishes of the entire industry are extended to Mr. Abels.

At the Congress the floors are lettered in place of being numbered. Maybe that was why Harold Humphrey insisted that he would not get off at "H," but was going through to "L."

W. H. Jefferson, of the Cutler-Hammer Company, has some idea what is going to happen in the next few years in the gas industry. In fact, he bet a dinner on one change, the dinner to be given twenty-five years hence. That's a long time to wait for a meal.

Bill Guitteau showed up on Tuesday morning. He at once became the center of a group and it was noticeable that there was much consultation of memorandum books. We would like to know if the telephone business of the Congress increased very much during the convention.

The absence of A. C. Bedford, chairman of the board of directors of the Standard Oil Company, who was unable to reach the convention because of the press of business elsewhere was greatly regretted. Alfred I. Phillips, gas engineer of the association, proved an able substitute for Mr. Bedford.

W. G. Haskell, Jr., manager of the Johnson Gas Appliance Company, interested a constantly changing group at his booth. Mr. Haskell showed himself a mighty able salesman.

Was everybody thoroughly impressed with that cap which graced the brow of F. C. Curfman? The howling winds of Tuesday combined with the sleet, hail and rain, had no terrors for him. Still, the cap was a nice one, we must say.

George H. Cressler, general sales manager of the Stacey Manufacturing Company, was one of the most enthusiastic men present. Mr. Cressler declared that this was certainly a convention for gasmen that would linger long in the memories of those who attended. Incidentally it might be said that Mr. Cressler did his share toward making it so successful.

L. F. Blyler, sales manager of the Hugo Manufacturing Company, expressed some really constructive ideas regarding co-operation between appliance manufacturers and gas companies. Mr. Blyler declared that manufacturers and gas companies should get together and see that every salesman for the gas company was thoroughly equipped with every bit of information possible before they started out. This is the right idea and one that should be followed out. The result will be increased sales; of that there can be no doubt.

The splendid newspaper publicity that was secured for the convention was due to the untiring efforts of Charles W. Person. Mr. Person, who is secretary of the advertising section of the A. G. A., worked hard during the convention and really accomplished a great deal.

Nominations and elections that previously have not been announced show that A. A. Higgins, of the Providence Gas Company, was elected chairman and B. J. Mullaney, of the Peoples Gas Light & Coke Company, Chicago, vice-chairman, of the advertising section. A. P. Post, of the Interstate Appliance Company, Philadelphia, and William C. Gould, of the Gas & Electric Development Company, Boston, Mass., were elected chairman and vice-chairman, respectively of the commercial section.

Dr. Garner Discusses General Aspects of Natural Gas Industry

There are a very few people who realize the enormous extent of time and labor, the everlasting watchfulness and the large expenditure of money entailed by the natural gas industry in the effort to give the public continuous gas service. Dr. J. B. Garner, industrial fellow of the Mellon Institute of Industrial Research, discussed the general aspects of the industry before a large body of scientists and natural gas men who attended the lecture on Nov. 7 at the institute.

The discourse, interspersed with figures, was given in conjunction with a first showing of motion pictures of the gas fields of West Virginia. Dr. Garner outlined his paper as follows:

1. Definition of the natural gas industry.
2. Occurrence of natural gas.
3. Composition of natural gas.
4. Operating organizations of natural gas companies..
5. Growth of the industry.
6. Magnitude of the industry.
7. Depletion of natural gas supply.
8. Physical equipment of the industry.
9. Natural gas gasoline.
10. Motion pictures.
    (a) Production.
    (b) Transportation.

Dr. Garner's address was as follows, in part:

"The natural gas industry is greatly concerned with the elimination of wastes, the reduction of losses and the removal of by-products, gasoline and water. The most momentous problem is the adoption of the most advantageous use for the rapidly declining supply. West Virginia is the greatest natural gas producing field in the world. In Indiana there has been rapid and appalling waste. Wyoming appears to be the great future prospect.

The natural gas in Pittsburgh has been of remarkable uniformity for the past fifteen years. The supplying of gas to Pittsburgh is a very difficult thing. There are more than 250,000 consumers in this city. From six o'clock to eight o'clock in the morning about 37,500,000 cu. ft. of gas are consumed; during breakfast the average gas range uses 30 cu. ft per hour: 5,000,000 cu. ft. are consumed during lunch; in the dinner hour approximately 50 cu. ft. are used in each home, averaging 12,500,000 cu. ft. This means that about 62,500,000 cu. ft. are consumed in the course of a single domestic day. The average daily consumption is equivalent to 140 carloads of coal for Pittsburgh alone. The consumer is not concerned to an appreciable extent with gas in the summer, and if it were not for the industrial consumers the industry would not be able to survive. The industrial consumer has learned the value of natural gas and he is the preferred consumer economically. In twelve years, two-thirds of the natural gas supply has been utilized."

In tracing the history of the natural gas industry, Dr. Garner said that natural gas was first used for domestic purposes in Fredonia, N. Y., in 1824. Domestic consumption was put on a commercial scale in 1865 when the first natural gas company was formed. In 1874 natural gas industrial consumption started with the use of gas in puddling and heating furnaces in the iron and steel business of Armstrong County, Pa. From that time the industry advanced rapidly until at present there

(*Continued on page* 453.)

Barnum Heads A. G. A. for 1922

Brown Elected Vice-President at Annual Convention

Chicago, Ill.—At the opening session of the third annual convention of the American Gas Association in this city Dana D. Barnum, vice-president and chief engineer of the Boston Consolidated Gas Company, of Boston, was elected president to succeed Charles A. Munroe, vice-president of the Peoples Gas Light & Coke Company, of Chicago, who has held office for one year.

R. B. Brown, general manager and chief engineer of the Milwaukee Gas Light Company, of Milwaukee, was elected vice-president, and Harry M. Brundage, secretary of the Consolidated Gas Company, of New York, treasurer.

Mr. Barnum was born in Bethel, Conn., August 15, 1872. He received his public school education in Bethel and later prepared for college at Wilton Academy, Conn. He then entered Stevens Institute and was graduated with the degree of M.E. in 1895.

Following his graduation, Mr. Barnum joined the E. W. Bliss Company, of Brooklyn, for a short period and then entered the employ of the Worcester Gas Light Company in Nov., 1895. He served in various capacities with that company and was elected to the office of president in April, 1915

In Nov., 1917, he was engaged by the Boston Consolidated Gas Company as vice-president in charge of manufacturing, and in 1920 became its chief engineer.

In the twenty-six years that Mr. Barnum has been identified with the gas industry, he has held important positions with the several gas associations of the country. In 1912-13 he was president of the New England Association of Gas Engineers; in 1916, chairman of the Technical Committee of the American Gas Institute, and in 1917-18 president of the Guild of Gas Managers. During the last two years he has served as a director of the American Gas Association.

Mr. Brown, general manager and chief engineer of the Milwaukee Gas Light Company, was elected vice-president. He succeeds Howard Bruce, of Baltimore, who has held office for one year.

Mr. Brown was born in Roselle, N. J., in 1872. He received his primary education in his native State and after two years' experience in mechanical work entered Lehigh University, graduating with the class of 1894.

His first position in the gas business was cadet engineer with the East River Gas Company, of New York City. From here he went to the Newark Gas Company as works' foreman, serving under Alfred E. Forstall, and later succeeded Mr. Forstall as works superintendent.

His next position was with the American Gas Company as general superintendent of works in charge of construction and operation at their several plants. Later he entered the employ of the Milwaukee Gas Light Company as chief engineer and soon thereafter became general manager and chief engineer in addition to serving as vice-president and director of the West Allis Gas Company and the Wauwatosa Gas Company.

Mr. Brown was an active worker from 1909 to 1916 in the American Gas Institute, filling the offices of chairman of the technical committee, vice-president and director.

He is a charter member of the Wisconsin Gas Association and has served as its president, vice-president and chairman of several committees, one of them being the committee on calorimetry which made the report resulting in placing the State regulation on a B.t.u. or heat unit basis, Wisconsin being the first State to adopt this standard for gas regulation. At present he is chairman of the public relations committee of the Wisconsin Gas Association.

Mr. Brown is a member of several national engineering societies and since 1919 has been a director of the American Gas Association.

Gas-Fired Hot Water Systems*

Their Application and Uses

By ALBERT A. SCHUETZ

Industrial Engineer, Milwaukee Gas Light Company, Milwaukee, Wis.

Hot water is used for such a variety of purposes that it is self-evident that no one method or system can be used to cover all requirements. This is true, both in the domestic and industrial field, but unfortunately this condition is not always given the attention that it should, with the result that many systems for heating water are installed which by no means give the customer the service which he expects or bargained for. We have mentioned the word "service," and I believe there is no better way of analyzing our subject than from the viewpoint of service, for, after all, it is the satisfaction of getting or having hot water when you want it and in the amount you want, which makes the most lasting impression even to the extent of forcing cost to the background. You can install the most efficient heater at low cost of installation, minimum maintenance, etc., but if the customer cannot have the hot water service which his whims or needs require, you will not have gained a booster for your product.

Classification of Heaters

With the point of service in mind, let us review the different types of heaters on the market and see what kind of service we can expect from them, arranging them in the following ascending order:

First on the list would be our old teakettle. Service here is secondary, as the user realizes that time must be allowed for the water to heat and his use of the same must be anticipated far enough in advance. Our large industrial hot water tanks are but overgrown teakettles and will carry with them the same service qualifications. The advantages and limitations of this type of heater will become apparent when considered in connection with any specific problem.

Following the teakettle and tank in point of service comes the circulating heater connected to a tank. Here also the use of hot water must be anticipated and the heater lighted sufficiently far enough in advance to insure the heating of the required amount of water. This heater finds considerable amount of favor in the small household, the heater being called upon to furnish water for the bath and family washing and cleaning. It can also be successfully used in small manufacturing plants where hot water is required only once or twice during the day for the employees to wash up before leaving the premises. If large quantities of water are required, but only at very infrequent periods, several of these heaters can be connected to one tank. A large number of heaters of this type carry only a summer load as the tank is usually connected to a water back or furnace coil, which arrangement makes it easy to obtain this class of business, the installation cost being small. It may be well, however, to say a few words here regarding furnace coils, since the consumer as a rule thinks it is costing him very little extra in the way of fuel to supply him with a tank full of hot water. Assume an average total length of three-quarter-inch coil at six feet, then the heating surface will be about 1.65 sq. ft., which surface will transmit about 19,800 B.t.u. per hour with water entering at 50, and leaving at 150, deg. Fahr. Assume further that the coil is inserted in the fire box of a hot water heating boiler, then 19,800

(*Continued on page* 450.)

*A. G. A. convention paper.

As the Journal Views It

TABLE OF CONTENTS

The Table of Contents will be found on page 4 of the advertising section, Hereafter it will be found on that page each week.

President D. D. Barnum

The selection of Dana D. Barnum as president of the American Gas Association at the third annual convention assures the members of the same high calibered leadership as has marked the organization during the two previous years. Mr. Barnum, who is vice-president and chief engineer of the Boston Consolidated Gas Company, brings to the office a wide experience in the gas industry and there is not the slightest doubt that he will lead the association into new fields of endeavor.

The American Gas Association has been particularly fortunate in obtaining for its officers men who are broad of vision and with wide experience and who can and have so ably represented the industry in its dealings. We believe that each one of us can congratulate ourselves that Mr Barnum has accepted the office for the coming year.

The President's Address

Ably indeed did Charles A. Munroe, retiring president of the American Gas Association, review the situation in this industry in his farewell address during the convention. Mr. Munroe touched upon the high lights of the past year, compared present conditions with those existing seven years after the Civil War and ended by declaring that there is a bright future for us and a long period of prosperity.

Mr. Munroe covered many subjects in his address, his first direct reference being to the subject of rate structures. His declaration that gasmen generally agreed on the fundamentals of the business was gratifying to those who have labored long in an effort to bring a uniform system out of chaos. There is no more important subject before the gas company executive to-day than that of rates and the method of fixing those rates. Many men have advanced their ideas regarding this matter and out of it all, as Mr. Munroe points out, there has come a course of action that should bring decidedly improved results.

Referring to the problem of taxation, Mr. Munroe declared that efforts have been and are being made to place the securities of the gas companies on the same plane as securities issued under State authority. In this position Mr. Munroe agrees thoroughly with the attitude of the AMERICAN GAS JOURNAL and it is to be hoped that those who had the pleasure of hearing Mr. Munrooe's address will add their weight to bringing a definite answer from the Congress of the United States. The question of financing is so closely related to taxation that it is difficult to conceive that those in authority can do other than agree with the contentions of the leaders of this field. It is time that sufficient pressure was brought to bear upon our elected representatives to show them that the prosperity of the country is closely bound up in the prosperity of the public utilities. It is for each man to decide in what way he best can aid, and then, having arrived at a decision, to carry it into effect.

With reference to educating the public, Mr. Munroe had some interesting things to say. He briefly told of the work that has been done in the past year and declared that the results obtained had fully justified the efforts made. His statement that the work must be continued as vigorously as in the past had great significance and it seemed to be the consensus of opinion that he had struck squarely. This, too, was in line with what the AMERICAN GAS JOURNAL has been preaching, and it was gratifying to find that so many agencies are at work with a single aim that of bettering relations between utilities and public.

In discussing rates, Mr. Munroe advocated the retention of the present rates. He decried the attitude of so many officials that because there has been a reduction in costs in many lines that the gas industry should fall in at once and reduce the rates that had been so hard to obtain. Mr. Munroe was absolutely right in saying that this is no time for a consideration along these lines and gasmen should oppose vigorously any attempt made to cut their income.

An extremely interesting point in Mr. Munroe's address was that relating to the proposed amalgamation with the Natural Gas Association. Any amalgamation along these lines should be seriously considered by gasmen, for it will mean a great strengthening of the organization. If the American Gas Association is to carry on and complete the work that has been begun, then the greater the strength that can be given it the more satisfying will be the results. But it is a question that requires a great deal of careful thought before any action is taken.

Summing up the president's address, it can be said that Mr. Munroe has fully covered his tenure of office in his address.

The AMERICAN GAS JOURNAL desires to extend to Mr. Munroe its heartiest congratulations on the manner in which he has conducted his important office during the

past year. With marked dignity, he has carried on the work and has achieved splendid results and in his retirement from the presidency can look back on his work with a satisfied eye. But it is to be hoped that we will not lose the benefit of his great interest in the matters that come before the association, but rather that we can always count on his counsel and advice.

Optimism Keynote of Third Annual A. G. A. Convention

(*Continued from page* 434.)

be subserved, economies effected and our fuel resources conserved."

One of the reports awaited with unusual interest was that made by the gas-oil committee, of which J. B. Klumpp was chairman. The committee at the outset announced the determined opposition of the association to any duty on the import of petroleum. Mr. Klumpp declared that any duty would be a severe handicap to practically 60 per cent of the gas industry which is found on the Atlantic Seaboard. In part the report was as follows:

"The American Gas Association opposes the imposition of a duty on petroleum. This association is acting on behalf of about 480 of the largest companies manufacturing gas in the United States. The basis for this opposition is the fact that petroleum, or its products, is used in the production of about 65 per cent of all the manufactured gas produced in the United States, and it is our earnest request that no action be taken favoring the imposition of a duty on petroleum that would tend to restrict the quantity of gas oil that will be available and necessary for the future production of the 160,000,000,000 cu. ft. of gas that must be manufactured yearly from this oil.

"At this time the quantity of gas oil used in gas manufacture amounts to over 24,000,000 barrels yearly, while a conservative estimate of the growth of the gas industry indicates that the quantity required in five years will amount to at least 28,000,000 barrels yearly.

"The quantity of gas oil required by the gas companies on the Atlantic Seaboard is about 60 per cent of the total of all gas companies' requirements, in the Mississippi Valley about 20 per cent, and on the Pacific Coast about 20 per cent. Therefore, it will readily be seen that a duty on oil aimed to protect production and supply in the Mid-continent field will impose a severe burden upon users of 60 per cent of all the gas oil sold; that is, upon those gas companies located on the Atlantic Seaboard or closely adjacent thereto, where practically the entire amount of gas oil is delivered by water from fields other than the Mid-continent.

"Any duty imposed upon crude oil will be reflected in the selling price of crude oil and its various products, so that a duty of 35 cents a barrel, or approximately 1 cent a gallon, on crude oil would tend to increase the price of gas oil about 1½ cents per gallon, which would result in an increase in the price of manufactured gas of about 5 cents per thousand cubic feet to some 43,000,000 people in the United States.

"Authoritative statistics showing the quantity of oil refinery products combine gas oil and fuel oil under one heading, so for this reason it is impossible accurately to determine the amount of gas oil produced, since all fuel oil is not gas oil. Fuel oil includes heavy residuals remaining after the distillation of the crude oil, "cracked" oils from which the increased gasoline production is now being obtained, and heavy crude oils that are not fit for gasoline production or gas manufacturing purposes.

"When the process of crude oil refining consisted of the simple distillation process, that portion of distillate obtained between kerosene and lubricating oil was sold as gas oil. However, with the introduction of the cracking process into the oil refining industry, the gas-oil portion is still further reduced to gasoline and a heavy residue useless for gas-making purposes.

"The subjection of gas oil or fuel oil to the cracking process is analogous in results to the subjection of gas oil to the gas-making process, in that heavy and ungasifiable residiums are left, gasoline being the desired product in the former instance and gas the desired product in the latter instance.

"In the gas industry the only substitute for carbureted water gas is coal gas, produced in coke-oven plants or retort plants. The least expensive type of coal-gas plant requires an investment about twice that for a carbureted water-gas plant of corresponding capacity, so that eventually to replace all water gas would necessitate an enormous duplicate investment and would require many years to complete. In addition, construction costs to-day are from 50 to 100 per cent and the cost of capital at least 50 per cent above normal. Hence the interest or fixed charges on the investment would be double that of normal construction and would continue so even when operating charges return to more normal figures.

"Coal-gas plants, however, are being rapidly installed, but the increase in capacity hardly meets more than the increasing demand for gas; therefore, unless the gas manufactured in the present carbureted water-gas plants contains considerably less oil per thousand cubic feet, no dimunition in the total demand for gas oil can be expected.

"There is another important fact which must be recognized when considering the installation of coal gas—namely, the growing scarcity of high-grade gas coals. The better grades of gas coals are being rapidly consumed by railroads and industries and by existing gas and coke oven plants; therefore, it will be only a comparatively short time when the poorer grades of gas coals must generally be used. With the use of these poorer grades, and under a continuation of the present high-quality gas standards required by regulatory authorities, gas oil will have to be used if the gas manufactured is to meet these high standards, so that even a partial replacement of the present carbureted water-gas plants by coal-gas plants will not greatly relieve the oil situation unless the regulatory authorities reduce the present high standards of quality now demanded in many localities.

"Still another important controlling factor which affects the installation of coal-gas plants is the disposal of large quantities of excess coke produced, which must be marketed at reasonable rates to make these installations commercially possible.

"It is evident from the foregoing reasons that the manufacture of carbureted water gas of necessity will be continued for a long time. Therefore, the gas in-

dustry must look for a continuance of a large supply of good gas-making oil, as nothing will take its place. To get this supply every effort should be made to guarantee its production or importation, so that the chances of a repetition of the serious condition faced by the gas companies during 1920 can be reduced to a minimum.

"The recent break in oil prices, to figures that are even now 50 to 100 per cent above pre-war figures, is temporary and due solely to the business depression, which has been accompanied by a decreased demand for gasoline, resulting from the temporary cessation of the use of automobiles, the shutting down of industrial plants which had been using oil as fuel, the present idleness of the merchant marine and the lack of activity on the part of the Navy. With this diminution in the use of oil, the tank capacity of the oil companies became filled and, with the continued high production and lack of storage, it was inevitable that prices should fall.

"If there had not been a great increase in oil importations the last two years, and if the business depression had not appeared during the past year, the country would be experiencing to-day an oil famine which would seriously restrict the use of the automobile and render the use of oil in the manufactured gas business practically prohibitive.

"All signs point to a general revival in business, and when this takes place the same condition of oil shortage as has been experienced and briefly described again will occur, only it will be intensified. The general use of automobiles is increasing by leaps and bounds, and their use will be restricted only through the inability of oil companies to produce sufficient gasoline for their operation. The production of gasoline will thus be stimulated, and all other products of oil distillation will be sacrificed to the production of gasoline. Thus will the shortage of gas oil again become acute, and again will the gas industry be faced with an oil shortage.

"It will be possible, however, to help this situation through importations of oil. Any restrictions placed upon oil imports render continued operation by a large percentage of manufacture gas companies throughout the country more difficult, especially those on the Atlantic Seaboard. This hinders the gas companies in the proper performance of their duty to the community and places an undue and unnecessary financial burden upon the gas consumers in the United States."

Parlin's Address of Interest

An address that created a great deal of comment was that made by Charles Coolidge Parlin, head of the division of commercial research of the Curtis Publishing Company. He said in part:

"Dislikes are founded on ignorance. People hate that which they do not understand. The gas industry has heretofore concealed the romance of its accomplishment, and as a result has had opposition. The industry and the methods of producing gas have, to the layman, seemed shrouded in mystery.

"The gas industry is the product of engineering. Its accomplishments have been an achievement which ranks with the great accomplishments of American genius. Processes of manufacture have been improved, production plants erected, and countless miles of pipe laid that supply homes in every part of the nation. Yet, in spite of its great accomplishment the industry finds it difficult to get a sufficient price for its services to attract the capital needed for the expansion of the business. The explanation seems to be that while the gas industry has succeeded in production it has failed in selling.

"The interests of the consumer and your interests are, in the last analysis, fundamentally alike. The customer wants, first of all, dependable service at as low a rate as it can be furnished. But there is no economy from the public's viewpoint in rates too low to maintain quality service. The public is price-conscious. They are seeking to get their prices back to the pre-war concept of values. But, above all else, they want quality—not something extravagant, but the quality which rightfully appeals to a person of sound judgment as the best thing to buy.

"Extension of gas service is being held up by lack of capital. The public should be educated to see that new extensions call for new capital; that you cannot be expected to finance extensions out of profits, and that to secure additional capital the industry must be on a profitable basis; that economies and low rates can only come through attracting and holding executive talents of high order, and that such talents can be commanded only by an industry in which it is possible to show a profit.

"The most important of these changes is one affecting the consumer market. The old-time market is coming back and the newly-found market is vanishing. Before the war a basic factor in the market was the group of people with fixed income—professional and salaried classes; foremen and workers with steady jobs, and investors living on income from interest on bonds, mortgages and other investments.

"During the war, as prices rose the classes found themselves with lessened buying power; for the cost of living increased more rapidly than their incomes, and as their incomes increased the cost of living remained a jump ahead.

"These classes, therefore, were obliged to buy less merchandise or to buy merchandise of an inferior quality. It seems probable, for the most part, that they bought less merchandise. A person of discrimination who has once become accustomed to a good quality cannot be satisfied with inferior quality, and is likely, under adverse conditions, to buy less merchandise, denying himself one article that he may purchase another of the desired quality.

"Meanwhile a new market appeared. The man who one day was a carpenter, the next a machinist, the following day something else, received unusual wages. Soon he and his family apeared in the markets seeking high-priced merchandise. They lacked power of discrimination, but they had money and wished to pay a high price. There was a reversion to old and garish styles. Extreme patterns were demanded and a ready sale was found for merchandise that had appearance without the reality of quality.

"But again the wheel of fortune has changed and many of those who made up this war-time market now have reduced buying power.

"Meanwhile the old-time market is gaining greater buying power. As the cost of living is reduced people with fixed incomes find that their incomes command more merchandise.

"The great significance of this fact is that this mar-

ket reads, thinks and discriminates. Merchants to-day state that patrons are critical. What they mean is that the war-time market which paid the price without question is gone—the old market which judges quality, which values advertised brands, which insists on the proper relation between quality and value, again is the major factor.

"Purchasers are price-conscious; but the merchant who supposes they want price at the expense of quality is mistaken. The market wants price, but even more it wants quality; it wants quality which will satisfy discriminating taste at a price which appeals to sound buying judgment.

"A second important change is one affecting the retailer and wholesaler. Costs of doing business are increasing. Almost every dealer has in his mind an average cost of doing business which seems to him normal for his business. When costs persist 1 per cent high, the situation requires attention; when they remain 2 per cent above normal, the situation looks alarming. With many merchants costs have reached a point which occasions anxious consideration.

"In the early part of the war period, as prices rose the volume of business, measured in dollars, rose more rapidly than did costs. The per cent of costs was reduced and an easy situation was created for the merchant. In each of the years 1919 and 1920 the number of commercial failures was less than for any year since 1882. In these two years it was so easy to make money that a merchant could scarcely manage a business badly enough to fail.

"But when prices took a downward turn, volume of sales shrank and costs remained high, creating a difficult situation for the merchant and causing the number of commercial failures rapidly to increase.

"How can the per cent of cost be restored to normal? Obviously, either costs must be reduced or volume increased. The merchant finds it very difficult to reduce costs. Rent and other overhead charges stand firm. It is especially difficult for a retail merchant to cut wages or reduce store services—it advertises a lack of store prosperity, which is undesirable in the community.

"The only other solution is to increase volume. If volume is increased, two difficulties are encountered: First, the extra volume must be handled in the same space; second, the extra volume must be handled without increasing the number of employees. Any additions add to costs and neutralize the effect of increased volume. This means fewer lines; but to get greater volume on fewer lines means greater need of taking advantage of markets developed by manufacturers' advertising.

"The merchant to-day is more open than ever before to concrete, practical suggestions as to how volume can be increased without increase of sales expense.

"The third great change is in education. A few years ago it was rare for a man to have a college training, and not many had been to high school. To-day the colleges do not know what to do with students who seek admission, and the largest building in every city in the land is the high school building. The number of people who can read, think and judge merchandise for themselves has been vastly increased."

Addressed Accounting Section

Commissions created for the purpose of regulating public utilities are taking a broader view of their duties now, De Witt Clinton, treasurer of the Worcester (Mass.) Gas Light Company, told the accounting section Thursday afternoon.

"Originally the entire object of commission regulation was to enforce fair dealing between the utility and its patrons," said Mr. Clinton. "For a long time the regulatory bodies insisted only on the 'fair dealing' by the utility, and ignored similar dealing by its patrons. Now, however, both the regulating powers and the public utilities have broadened their vision and a fine spirit of co-operation is beginning to exist.

"Gone forever is the old popular idea that the only function of the regulating commission consisted of protecting the public against the utility so that the customers will pay the least possible amount for the product supplied by the public utility. The tendency of all public utility commissions to-day is to recognize that public utilities are entitled to similar rate of income as other industrial business, and that the function of a regulating body is twofold: not only must it protect the public from paying rates that may be in excess of the requirements of the company, but the regulators have a duty toward the company to protect it and secure for it such rates as will not only pay operating expenses and fixed charges but yield a reasonable return upon investment, thus insuring and encouraging capital to invest and develop the business. A growing appreciation of this latter function is distinctly shown in the tenor of the language used by many of the commissions when handing down recent decisions on requests for increased rates."

Mr. Clinton pointed out that regulation of commerce and industry is not new, but dates back to the day of early civilization.

"Before the dawn of the Christian Era the grain trade was rigidly regulated in Rome, even as to price," said Mr. Clinton. "The butcher and the baker were held in check by regulation as far back as the Middle Ages, and the inn-keepers and common carriers have been regulated from the beginning of Anglo-Saxon civilization. The old law of self-preservation, or self-preferment, is the fundamental cause for regulation."

Premium Idea Worth While

The Knoxville Gas Company, of Knoxville, Tenn., selling a pipeless furnace on a deferred payment plan, advertised that it would give one ton of coke free to every purchaser of a furnace during the progress of a recent sale. This proved a premium idea worth while, for it accomplished good results in point of sales volume.

The Tampa Gas Company, of Tampa, Fla., boosted sales of gas ranges and gas heaters recently during the progress of a special sale by giving absolutely free to the first thirty purchasers of a gas range at this sale, a heater that ordinarily retailed for $9. "A small payment down and then monthly with your gas bill," the company advertised.

During the month of October the Knoxville Gas Company, of Knoxville, Tenn., gave to every purchaser of a pipeless furnace the company handles, a twenty-two-piece set of community silverware.

Local Ownership of Utilities Emphasized at Public Utilities Association of West Virginia

The attendance at the annual convention of the Public Utilities Association of West Virginia, held at Charleston, W. Va., Oct. 20 and 21, included members from all of the important utilities in the State with the exception of telephone companies, and it was planned to take in 150 such companies, which will make the association include every line of public utility in West Virginia.

The principal address was made by James P. Barnes, Louisville, president of the Louisville Railway, and considered "the pressing problems of public utilities." The subject was divided into three classifications: (1) A study of symptoms; (2) diagnosis of ills, and (3) treatment for their correction. Many principles mentioned are applicable to every utility. Mr. Barnes said, in part:

"In the past stocks may have been manipulated and property accounts watered in the interest of individuals. Admittedly this is not good business to-day; neither does the present physician bleed his patients; yet who shall say that many lives were not prolonged to the benefit of posterity by the old and now discarded methods of the practitioner? Blood renews itself; so has capital in many cases; and generally the true corporate history will show that the renewal of capital has not been from excess earnings but from withheld dividends.

"The diagnosis of our public utility ailments has been delayed for many of us because of the acute discomfort of the symptoms. Our tendency has been to treat the symptoms in the hope of immediate relief from discomfort rather than seek to treat the disease.

"Times have improved. The public conscience has awakened; individual conscience has awakened; the public is better represented to-day in its officials, elected and appointed, generally speaking, than it was in the past. Business morals have improved, and with this general improvement there has been a vast improvement in the corporate morals of public utilities.

"Business practices generally recognized in generations past as not only defendable but admirable would to-day meet a storm of protest and execration around any directors' table. Public utilities may be suffering from earaches in New York, ulcer in Detroit, cancer in Des Moines; but this does not imply fundamental weakness or unfitness in the utilities themselves. Local irritation may produce a strange and unusual symptom requiring special treatment."

A. H. Grimsley, of the Virginia-Western Power Company, Clifton Forge, Va., declared that "every band and newspaper in the territory served by a public utility should advise those who put their trust in bankers and confidence in editors to buy of the preferred stock of the utility. Any banker that will not do this, if the utility is earning operating expenses, full depreciation, fixed charges, preferred stock dividends, and has proper equity behind the junior securities, is avowing himself as so selfish that he would rather have the use of the money of his depositors than to see them buy gilt-edged securities. Every editor who fails to boost will be advertising himself as a grouch who prefers to see public utilities owned by foreign capital than by home folks. All that is necessary for the public utility to deserve the trust of bankers and the confidence of editors. If the public utility can't send a satisfactory statement to the bank and can't convince the editors that it is responsible, I take the position that there ought not to be a ready sale of its securities."

George R. Wiles, of the Public Service Commission, spoke on "Advantages of Local Financing," bringing before the convention for discussion a phase of the relation of public utilities to the communities served. Mr. Wiles said:

"The Utopian idea is public ownership of public utilities, but the recent experience of the Government with the railroads has shown the fallacy of this idea. One of the most valuable assets of a public utility and the most difficult to obtain is good-will. The average man looks with suspicion on the average public utility. Most of the utilities in West Virginia are owned by outside capital. Williamson, my home town, has made an effort to sell stock in a public utility through the newspapers recently, which is an encouraging sign. I hope the time will come when the public will look upon the public utility with a more favorable eye."

Discussing the address of Judge Wiles, Mr. Grimsley told how in the old days his company had difficulty in getting an advance in rates; how there would be public meetings which were packed and jammed with indignant citizens. Since there has been an effort to place the securities of the utility in the hands of home people a similar meeting was advertised and twenty people turned out, of whom eighteen were in favor of granting the utility a just increase in rates.

Election of Officers

The election of officers at the convention resulted as follows:

President—Herbert Markle, Bluefield.

First Vice-President—C. P. Billings, Wheeling.

Second Vice-President—Mentor Hetzer, Moundsville.

Third Vice-President—E. W. Alexander, Charleston.

Treasurer—A. M. Hill, Charleston.

Executive Committee—C. C. Bosworth, Elkins, W. R. Power, Huntington; A. H. Grimsley, Clifton Forge, Va.; A. C. Babson and C. S. McCalla, Charleston, and C. H. Brues, Wheeling.

Members of Institution of Gas Engineers Visit S. Metropolitan Gas Co. Works

Members of the Institution of Gas Engineers recently visited the works of the South Metropolitan Gas Company, at East Greenwich, R. I., which is the largest of the company's gas-making stations. During the winter months about 5,000 tons of coal per day are carbonized by this company, and of this quantity 2,300 tons are dealt with at the East Greenwich works, which cover an area of 150 acres. Nearly four hundred people were entertained at luncheon in the main hall of the institution which is attached to the gas works, the music being provided by the "Metrogas" Band.

Compressed Air in Clearing Gas Piping

How One Company Removes Rust Stoppages

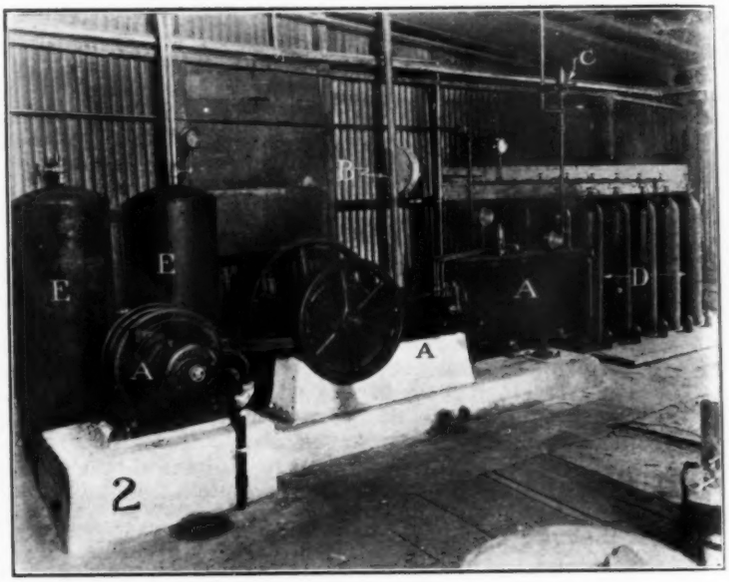
By J. T. GRIFFIN

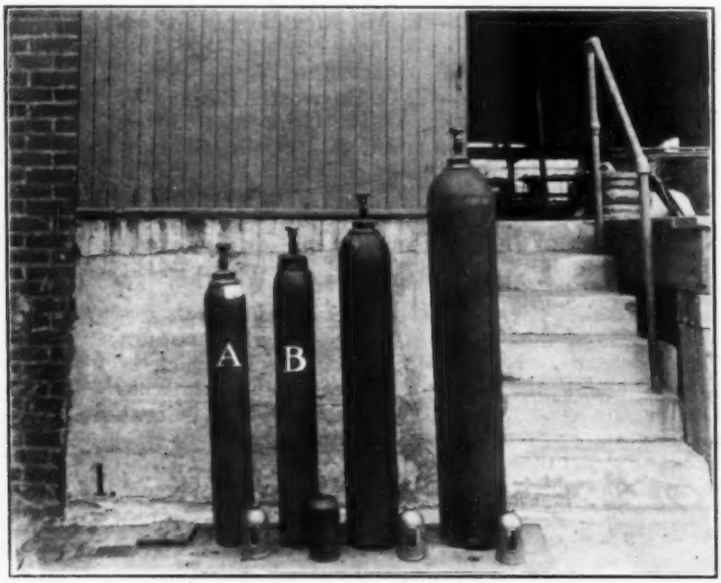
Consolidated Gas, Electric Light & Power Company, Baltimore, Md.

Prior to Jan. 1, 1920, the method resorted to by our company in removing stoppages of rust in gas lines was by means of compressed air generated by the device known as the "bell pump."

Experience had taught us that the use of the bell pump produced satisfactory results in a large percentage of cases where the stoppage was of a dry nature and of loose formation. Its use was not effective in those cases where the stoppage, due to dampness, became practically a packed mass. In these cases the failure to remove such an obstruction was due to the impossibility of maintaining a continuous pressure of air so that the obstruction could be broken into relatively fine particles which might be expelled from an outlet made by the disconnection of the meter from the house line. This was, of course, due to the limited volume of air stored, which might or might not have been of sufficient pressure. Because of this, the air when suddenly released into the piping, had a tendency to scatter the rust until the force of the charge was exhausted. This required several recharges, with the result that in many cases the rust became packed at some fitting in the pipe, thus creating a more or less solid formation. When such cases occurred, which according to our records amounted to about 30 per cent of the total, it was necessary where the piping was concealed, to take up the flooring, cut the piping and insert a wire known as a "fish tape" in order to grind this formation into fine particles.

As this process was expensive, our company set about to adopt other means of clearing pipes. After careful study it was decided to utilize highly compressed air, which method had already been successfully operated by the United Gas Improvement Company, at Philadelphia.*





Tanks were purchased from the William Wharton, Jr., Company, Easton, Pa. These were of four kinds, weighing from 40 to 160 pounds each (see sketch 1). They were tested by the manufacturers to 9,000 lb. hydraulic pressure.

In the beginning, arrangements were made with a concern in our city to have these tanks filled to a pressure of 1,500 lb. Subsequently we installed an Ingersoll-Rand compressor (see sketches 2 and 3).

After the stoppage has been located, the meter is disconnected and a bag is tied around the bottom of the outlet connection (see sketch 4). The high-pressure tank is then connected to the furthest outlet beyond the stoppage. This outlet is created by disconnecting a fixture or appliance, and tank connected by means of a three-eighth-inch iron pipe (see sketch 5). The essential feature in the use of the air is that it be released in a continuous flow with increasing pressure. This is controlled by the operator, and in no case should it be intermittent, as in the case of the bell pump. The success of this operation depends entirely upon the manner in which the air is applied and the possibility of creating any leaks or damage to the piping due to too high pressure is minimized by intelligent care on the part of the operator who is manipulating the tanks.

When the air is first released into the piping, it ex-

*Refer to paper of R. B. Duncan, superintendent, Spring Gardens district, Philadelphia Gas Works, contributed as a discussion of the paper by C. R. Henderson at the October, 1919, meeting of the American Gas Association.

cases. These figures are based on the completion of 500 jobs by compressed air and 300 jobs by the bell pump method.

Equipment	No. of Jobs	Average Time
Bell pump	300	2 hr. 53 min.
Compressed air	500	1 hr. 15½ min.
Average saving in time		1 hr. 37½ min.

At the present time, with the aid of the small tanks, we are about to adopt the motorcycle for transportation instead of the horse-drawn vehicle.

As stated before, we have now started using compressed gas for removing stoppages in service pipes. Our experience so far, has been very limited, but results as shown by inspection several days after the gas was used indicated that no undesirable results had been produced. In several cases, workmen were stationed in houses adjoining the one in which the service was being pumped in order to ascertain if a sudden high pressure of gas had a tendency to disturb the burning conditions in adjacent property. Burners were lighted and pilots particularly noted, and in such cases no disturbing action was observed. Considerably more care must be exercised in the use of the gas on services than is required in the work on house piping.

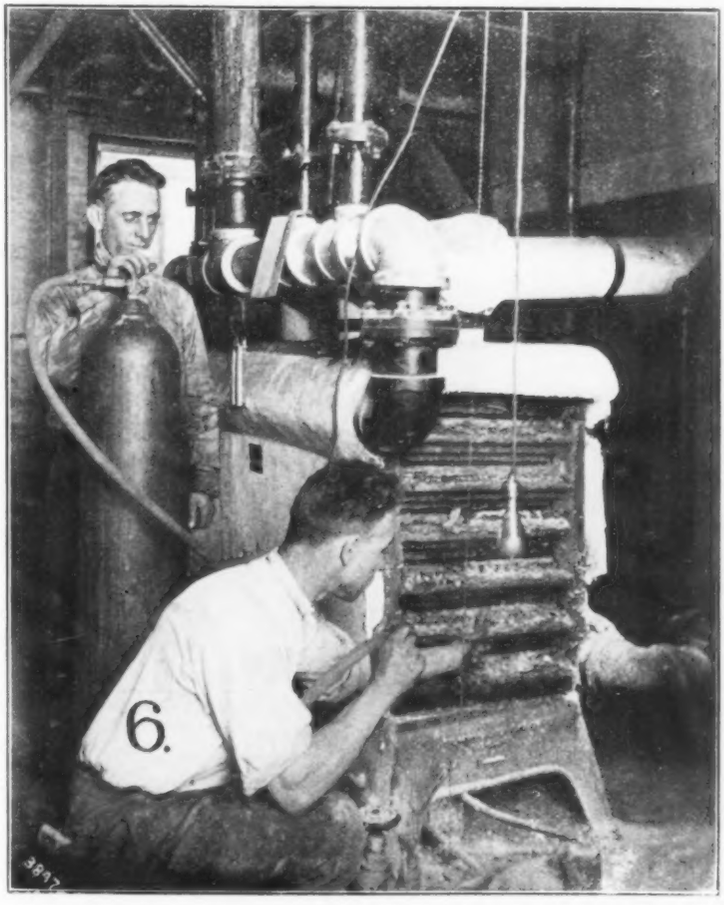
Arrangements are now being made to use compressed gas in clearing stoppages in street lamp post risers. The writer feels that as our experience goes on we will later be better qualified to give further data on the results obtained.

Another purpose for which we are using compressed air is to remove corrosion or scale from house heating boilers (see sketch 6). It was formerly our practice to clean these by means of hand brushes and wires. The time consumed by the old method, which includes replacing any asbestos covering removed, was from eight to ten hours. When compressed air was used, hose of sufficient strength was utilized, together with copper tubing of various lengths and with very small bore. Results show that after the removal of the burners, the time consumed in blowing this rust off averaged from twenty-five to forty-five minutes. The final saving in the operation, which included the mounting and replacing of the asbestos, was from eight to ten hours, under the former method, to two or three hours under the latter method, which included the delivery and collection of the tanks.

As time goes on, we are gradually finding more uses for compressed air. Our most recent use for compressed air was the blowing out of an obstructed drain pipe to a city sewer pipe.

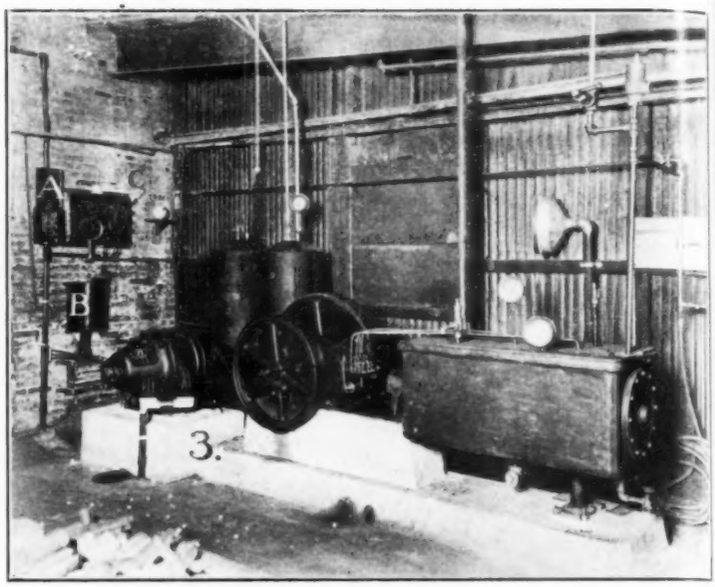
Within the past week we have used it on a condition where the house line was over 1,000 ft. in length, underground. This house line was trapped and filled with water. By releasing the full charge of the tank into the line we were able to scatter the water so that temporary service could be given. Owing to the location of this trap, which was a considerable distance from the meter house, only a portion of the water could be removed, the force of the air scattering the water along the diameter of the pipe, which again would seek its level and cause trouble. In this particular case we were compelled to make permanent remedies by removing the trap.

On another occasion a consumer in one of the former ammunition plants desired to use an old six-inch steam line, buried in the ground, for gas. Our company was requested to test the line for tightness, and our investigation developed the fact that the line was



pands due to its being thrown into a larger diameter and the pressure decreases considerably. However, as it strikes the stoppage this pressure builds up to a point where it will break to pieces any solid matter which may be in its path. Of course, there is always the possibility of choking the house pipe in the event of too great or sudden a charge being given. When such a condition arises, the observing tank operator is always warned of its existence, as the air going into the pipe creates a noise and the action of the air against the stoppage can be noted by him. When the stoppage is relieved, there appears to be a sort of swishing noise as the pressure is released, but in the event of the stoppage not being removed there is a noise which indicates a building up of pressure in the line, which is a warning to the operator that the stoppage still exists. When a stopage of this nature occurs, the tank is transferred to an outlet in front of the stoppage. In such cases a pipe or hose connection is made from an outlet to an open window in order that the rust may be blown into the open.

Results have shown that we have been able to clear the piping after we have stopped the same up in 98 per cent of such cases. In those cases which we could not clear, many interesting conditions were noted upon our cutting the pipe to ascertain the cause. In one instance a marble was found; in another, a piece of rag; in still another a piece of wood; on one occasion, a piece of sponge; and in several cases, metal "gas saving" devices. It was apparent, in all such cases, that the consumers had placed these articles in



the piping with a view to economizing on their gas bills.

Considerable apprehension was felt concerning the use of this system, due to a fear that the excessive pressure would cause fixtures to leak. After various tests we decided to equip the tanks with a valve containing an opening of very small diameter. We selected our best workmen and gave them considerable training before permitting them to operate the tanks.

We have found that best results are obtained when an additional charge of air is introduced after the stoppage has been removed. This will thoroughly clear the line of any fine particles of rust which remain in the piping. It was discovered at the start that these fine particles were carried along by the pressure of the gas and became lodged in any incandescent lamps or burners which were in use.

We originally compressed the air to 1,000 lb. and subsequently raised the limit to 1,500, as we have found that with the latter pressure better results have been obtained. It has also been found that the greater the rapidity with which this rust is discharged from the piping the less possibility exists for depositing rust into the fixture stems. It was also noted in two particular cases wherein stoppages had been in fixture drops within several inches of the running line, that the force of the air rushing through the main line had in both cases removed the stoppages from these particular points.

With the larger tank (shown in sketch 1) we clear an average of from six to eight stoppages. This tank, owing to its weight, requires a fitter and a helper to handle it. At the present time we are using this type of tank charged with compressed gas exclusively in clearing services where it is always advisable to have fitter and helper on the job. As an economical measure, we are now using tanks "A" and "B," which weigh about 35 or 40 lb. These can be effectively operated on house pipes by one man and will clear from three to five jobs each.

As the result of a comparison of the use of highly compressed air versus the bell pump method, the following saving in time was obtained, based upon the time of a fitter and helper and wagon used in both

waterlogged. Two large tanks of air under 1,500 pounds pressure were connected and released at the same time. As a result, the water was driven from the line and forced out of a manhole opening 400 ft. away and thrown to a distance of about ten feet in the air.

We had another case of stoppage in a line under one of the city piers. This line was supplied from the meter by a two-inch pipe 1,200 ft. long. Two tanks of air were gradually released into the line and when discharged into the open the stoppage was thrown about thirty feet in the air, against the rafter of the pier.

Our company feels that from the excellent results obtained, the use of highly compressed air is indispensable in rendering good service to our customers. It has proven an inexpensive and satisfactory solution of one of our most aggravating problems, and we therefore unhesitatingly bring it to the attention of the gas fraternity with our stamp of approval upon it.

Munroe Sees Prosperous Times Ahead

(*Continued from page* 436.)

Proposed Amalgamation with Natural Gas Association

A great sister association is devoting time and energy in the publication of much of the work which is being performed by this association. I refer to the Natural Gas Association of America. As it becomes necessary to amplify the natural gas supply with artificial gas, the work of duplication will become more apparent, and it would therefore seem proper that there should be an amalgamation of these two associations, in order that there be one association 100 per cent representative of the gas industry.

Judging the Future by the Past

Let us now, for a moment, take a backward look, for we may be able to judge the future by the past. After having enjoyed an era of great prosperity for more than twenty-five years, the gas industry generally throughout the country, after the Civil War, encountered difficulties similar to those which have confronted our industry for the last seven years. On March 1, 1867, the board of directors of the Memphis Gas Light Company published in pamphlet form for distribution the company's reply to the complaint of the city that the rates charged for gas were exorbitant. I quote from that pamphlet as follows:

"It is worthy of mention that out of near six hundred gas companies in the United States less than one hundred and fifty are paying 6 per cent on their value or cost of construction, and many are being operated at an absolute loss, as a matter of convenience to their stockholders, who are consumers.

"As to the price charged in this city, there has been so much misrepresentation that we beg to make comparison with some other places. It has become a stereotyped expression, with some classes, that the people of Memphis are charged more for gas than the people of any other city on the continent. The net price charged by this company is $5.50 per 1,000 cubic feet, with no meter rent. The price in St. Louis is $4.50; in Nashville $4.50; in Mobile $5; Atlanta, $5.50; Savannah $6; Norfolk $6; Natchez $6; Vicksburg, $6; New Orleans $4 (are restricted to this price by their charter or would charge $6); Charleston, $7 (but contemplate a reduction to $4 in gold); Montgomery, $8; Macon, $8; Galveston, $8; San Francisco, $6 in coin, and Sacramento $9 in gold (payable weekly on presentation of the bill).

"In a majority of cities where gas is sold at $5 or less, meter rents, etc., are collected, quite sufficient to swell the receipts to about an average of 50 cents per thousand cubic feet over the rate charged on the item of gas. With reference to the price charged elsewhere, the price here is lower than that of nearly any other article of common use, as compared with prices before the war, say in 1860. For instance, the price of gas was then $3.50 per thousand cubic feet, and is now sold at $5.50; rate of increase 57 1/7 per cent. Coal was then sold at 50 cents per barrel, is now sold at $1.15, and until very lately at $1.50; rate of increase, 120 per cent, and until very lately 200 per cent. Flour and sugar have each increased 200 per cent; bacon, beef, fresh meats, butter, eggs, poultry and fruits have all increased in price 100 per cent. Boots, shoes, hats and clothing generally have advanced 100 to 120 per cent, lime at the rate of 133⅓ per cent, and ordinary labor just 100 per cent. Coal oil is the only article of common consumption that is cheaper than it was six years ago and, while every article upon which the cost of gas depends has increased from 100 to over 200 per cent, the price charged for it has advanced from its very lowest rate but about 57 per cent, and it is now, with but a single exception, comparatively the cheapest article of ordinary use enjoyed in the city."

History Will Repeat Itself—Prosperity Coming

The most discouraged and disheartened man in this room is no more so than were the owners of gas properties throughout the country in 1867, as shown by the statements in the foregoing quotation. It is interesting to observe with what precision history has repeated itself by reproducing in the seventh year after 1914 the exact conditions prevailing in the seventh year after 1860. The general financial condition and earnings of the properties at these two dates, fifty-four years apart, are substantially the same, while the percentage increase in the price of commodities which go into the gas manufacture, including the cost of labor, are almost the same to-day as they were in 1867.

The achievement and prosperity which was enjoyed by the gas industry in the twenty-five years prior to 1860 sinks into insignificance when compared to that of the following forty-seven years, and if history continues to repeat itself, this great industry of ours will outdo in importance and in public service the achievements of the industry in the period between the Civil War and the World War by as much as that period overmatched the accomplishment of the twenty-five years preceding the Civil War.

Announce Annual Meeting

Charleston, S. C.—J. E. Gibson, president of the Tri-State Water and Light Association, announces that the next annual meeting of the organization will be held at Spartanburg, S. C., April 19, 20 and 21. Superintendents of water, electric light and gas lighting plants in Georgia, North and South Carolina, comprise the membership of the association.

Gas-Fired Hot Water Systems

(*Continued from page* 440.)

divided by 150, the B.t.u. per square foot transmitted by a cast-iron radiator, gives 132 sq. ft. as being equal to the heat absorbing power of six feet of three-quarter-inch coil, and 132 sq. ft. of radiation would be equivalent to a two-column forty-five-inch twenty-six-section radiator, which radiation is sufficiently large to take care of two average-sized rooms. If, then, a heating boiler has been installed which is too small or barely large enough for the load placed upon it, and a heating coil equivalent in heating power to supply two rooms is added, it is little wonder that some people have a hard time keeping their homes warm during extremely cold weather. Furthermore, the placing of a coil in the fire box of a heater generally tends to reduce materially the fuel space in the fire box with the result that fuel does not burn as evenly as it should, for the presence of the coil has a chilling effect on the fire. If these features are carefully explained to the customer, a goodly portion of the circulating heaters can be made to carry the yearly load instead of a seasonal load, as a good many of them are now doing.

The Next Type of Heater

Our next type of heater is the automatic instantaneous heater of which, as you all know, several different makes are on the market. In these heaters, the opening and closing of a faucet produces the motive power, turning the gas on and off. The details of these heaters are familiar to you all and do not call for any description. The field for them, however, is large but their use is limited, and great care must be exercised in their application, for the following reason: The flow of water through the heater is limited, the larger sizes having a flow of about eight gallons per minute on a basis of a 60-deg. rise. In places where the tap temperature is low (as is the case in Milwaukee where 40 deg. Fahr. is usual during the winter months) a rise of 60 deg. is not sufficient and the flow must be throttled down to less than eight gallons per minute in order to reach the desired temperature, and since the average faucet can deliver three to four gallons per minute, it is impossible to supply more than one or two faucets at a time. This also means that the faucet nearest the heater usually passes the greater amount of water and the more remote faucet gets very little, or, as is generally the case, none at all. This condition of unequality makes itself felt very markedly if a shower bath is being supplied at a remote distance from the faucet, for the opening of a faucet nearer the heater will take the flow and the occupant of the shower will get an unexpectedly cold quantity of water. Summing up the proposition then, we have a heating system which produces water on demand but is limited in the amount which can be drawn simultaneously through a number of faucets.

The last type in our classification is the automatic storage system using a tank for the storage of the water and a heater thermostatically controlled by the temperature in the tank. In this system water can be had instantly, for it allows the use of circulating pipes from the faucet back to the tank, so that hot water is flowing in the pipes at all times. It is also possible to draw water at a number of faucets simultaneously, making it applicable to large residences, apartment houses, restaurants, public buildings, office buildings, hospitals, etc.

A Comparison Between an Instantaneous and Storage System

With the above classification at hand, we can readily see that a heater or heating system has been developed for practically every demand and it only devolves upon us to be careful in selecting the proper type for each particular case. Types one and two, however, hardly need to be discussed further, as the applications are fairly well defined, but the dividing line between an automatic instantaneous heater and an automatic storage is not so well marked, and it will pay us to devote a litle time to these two types. To illustrate how careful we must be in our decision, let us assume two residences of the same number of rooms and occupants of, say, three people in the family and a maid and chauffeur. There is a family bathroom equipped with a tub and shower bath, while the maid's and chauffeur's rooms each have a tub bath. The buildings have no hot water systems and we are called upon to supply them. We approach Mr Black and explain our various systems to him and what can be expected from each. We have estimated a difference of about $150 in favor of an instantaneous heater as compared to a storage system, and that the fuel cost is also in favor of the instantaneous heater. The only feature against the instantaneous heater is the fact that only a limited number of faucets can be used at one time. Mr. Black is frugal and decides that the hot water can be so used in his home as to overcome this difficulty. We have also investigated the arrangement of Mr. Black's home and find the family bathroom is on the first floor, with practically a direct line to the heater. An instantaneous heater is installed and we find that Mr. Black is satisfied, the heater giving the class of service which we outlined to him. We next call on Mr. White, who leans a little towards convenience, and can well afford spending a couple of hundred additional dollars on his home. We again explain our various systems and find that he does not wish to give special orders as to when he personally wants to draw water for his daily shower bath, nor does he expect his family to do so. There should be hot water instantly and at all faucets. A storage system is installed, and since the bathrooms are quite remote, circulating pipe lines are used. Mr. White's gas bills are higher than Mr. Black's, but he realizes that he is paying for service which Mr. Black cannot enioy. This is probably drawing a rather fine distinction, but these conditions do exist and must be given recognition, for I assure you, gentlemen, that merely counting the number of faucets in a man's home will not give you the information which you must have to supply a satisfactory system.

Collecting Data and Surveying Premises

The natural question, then, arises, How can we decide on what is proper? I would suggest the method which we have been following in Milwaukee. We have supplied ourselves with recording gas meters, temperature recorders, water meters, etc. If a pros-

pective customer is already supplied with a hot water system, but is experiencing trouble with it for one reason or another, we can, at very little expense, get the complete data of his system and are then in a fair position to determine the trouble. It may be that the system is entirely too small or possibly it fails only during the peak hourly load, or possibly fails only on certain days during the week, when cleaning or scrubbing takes place. A survey of the piping is also made to be sure that no cross-connection into a cold-water line exists, or that return lines are feeding water to the faucet. Sometimes we find that the heater and tank had better be moved to another part of the house or building to lessen long pipe runs and cut down radiation. In fact, it pays to look at a proposition from all angles, for the same cause which makes the coal heater fall down on the job may be at work when you have installed your gas heater, and I am always a little skeptical about the man who wants a gas heater, by all means, thinking that his troubles will then be solved, even if it will cost him more, as he tells you.

High gas bill complaints can also be checked up very readily by the use of the above-named instruments, and the gas per gallon readily computed. The mere fact of interest shown by a company in thus handling a man's complaint will tend in a good many cases to place an irate customer in a frame of mind where you can reason with him. When you picture to him how many gallons of hot water are used on his premises and that the gas used per gallon is within reason, and that he always has a sufficient supply, the complaint will generally take on a different aspect, with your customer finally remarking that he was unaware of the large amount of water being used and that steps will be taken to decrease it. At this point of your argument it will be well to suggest to him that he use self-closing faucets on all his lines, making it impossible to waste water by leaving a faucet open. Also call his attention to any leaks which may exist.

Investigation of this kind is particularly helpful where a different type of heating system was previously used. Invariably the old system was replaced because it was too small, the water being used in keeping with the supply even to such an extent that some faucets were not used at all. With the advent of a new and larger system, the gas bill will increase, for the supply is now adequate. Your customer, however, is human and although he will admit that more water is used, still to his mind his bill has not increased proportionately. This complaint is typical where an instantaneous heater has been replaced by a storage system, and right here let me add that there are a good many instantaneous heaters in operation which should be replaced by storage systems with the result that more water would be used with a corresponding increase in gas consumption.

Operating Cost

The operating costs of hot water systems are somewhat analogous to the operating costs of an automobile inasmuch as the cost depends upon the kind of handling they receive. If an automobile is used for city driving with short runs and frequent stops, the cost of operation will show one figure, while a machine used for long runs and very little gear shifting will have a far lower cost. In preparing cost figures, therefore, on a water-heating system, we will often find that two heaters under similar installation conditions and same water consumption will show different gas consumptions per gallon. One heater may be called into operation for, say, 200 gal. per day, drawn 50 gal. at a time, while another heater is used to deliver the same total but for 5 gal. at a time. Now then, if the hot water lines to the faucets are not covered, it is readily seen that heat losses from hot water remaining in the pipes is proportionately greater in the second case, which again emphasizes the fact that all hot water lines should be covered as far as possible, even in the walls, for it is often found that there are strong air currents at work there. Appended to this paper are several tests giving the information necessary in order to make comparisons between different installations. We do not claim that the gas figures given are ideal, but they are typical of existing installations, and are a criterion of what to expect.

In conclusion, I think we can all agree that there is still a large amount of business to be had in this branch of gas sales, especially where storage systems are required, for the instantaneous heater, although it carries along high maintenance expense, has already made considerable headway in supplying us with hot water. If we will, then, only remember that each system, as outlined, has a different service value, we will be far better able to anticipate the wants of our customers, in the end making for better satisfaction and increased gas sales revenue.

Comparison of a Hot Water Storage System and an Instantaneous Heater Supplying Water for Restaurant Use

Data for old installation—instantaneous heater:

	Meters		Consumption Water			Gas Per
Date	Water	Gas	Cu. Ft.	Gal.	Gas	Gal.
1-26-21	68,267	317,400	...	.....	.....	....
1-27-21	68,433	320,000	166	1,245.0	2,600	2.08
1-28-21	68,597	322,400	164	1,230.0	2,400	1.95
1-29-21	68,750	325,000	153	1,147.5	2,600	2.35
1-31-21	69,126	330,500	376	2,820.0	5,500	1.95
2- 1-21	69,298	333,200	172	1,290.0	2,700	2.09
2- 2-21	69,463	336,000	165	1,237.0	2,800	2.27
2- 3-21	69,603	338,300	140	1,050.0	2,300	2.11

Average gas per gallon ..... 2.11 cu. ft.
Temperature of inlet water..... 42 deg.
Temperature of outlet water..... 128 deg.
Temperature rise ..... 86 deg.

Note.—This heater supplied hot water to an adjoining candy kitchen.

Upon installing storage system, this was discontinued.

Important.—Before test, new coils and burners were inserted and heater entirely overhauled.

Storage System

New installation—storage heater, 150-gal. tank.
Data—before covering with asbestos:

Date	Meters Water	Meters Gas	Consumption Water Gals.	Consumption Gas Cu. Ft.	Gas Per Gal.
2- 7-21	69,889	343,400	.....	.....	....
2- 8-21	70,030	346,100	1,057.5	2,700	2.55
2- 9-21	70,140	348,200	825.0	2,100	2.54
2-10-21	70,278	350,800	1,035.0	2,600	2.51
2-14-21	70,895	361,300	4,627.5	10,500	2.27
2-15-21	71,052	364,300	1,177.5	3,000	2.55
2-17-21	71,377	369,500	2,437.5	5,200	2.13
2-19-21	71,640	374,000	1,972.5	4,500	2.28

Average gas per gallon ..... 2.40 cu. ft.
Temperature of inlet water..... 42 deg.
Temperature of outlet water ..... 155 deg.
Temperature rise ..... 113 deg.

Remarks.—During this period an indefinite amount of hot water was sold to the candy kitchen. Whether or not all of the water used was heated to 150 deg. could not be ascertained without the use of a recording thermometer.

Storage System Covered

Description of Covering.—Four-ply air cell blocks wired in place, finished with half-inch thickness cement felting and covered with canvas jacket.

Data—after covering heater, tank and two-inch connecting lines:

Date	Meters Water	Meters Gas	Consumption Water Gals.	Consumption Gas Cu. Ft.	Gas Per Gal.
3- 1-21	72,917	395,400	.....	.....	....
3- 8-21	73,952	411,200	7,762.5	15,800	2.03
3-12-21	74,307	416,400	2,662.5	5,200	1.96
3-15-21	74,673	422,100	2,745.0	5,700	2.08
3-21-21	75,411	433,400	5,535.0	11,300	2.01
3-25-21	75,913	441,030	3,765.0	7,630	2.02

Average gas per gallon ..... 2.026 cu. ft.
Temperature at inlet ..... 42 deg.
Temperature at faucets ..... 155 deg.
Temperature rise ..... 113 deg.

Hot water used at seven faucets (total)—
Five large kitchen zinc basins,
One lavatory,
One eighteen-gallon hot water urn.
Greatest distance to faucet—85 ft.
Piping to faucets—non-return.
Gas consumed per hour—135 cu. ft.
Gas pressure—36—10 in.
B.t.u. per cubic foot of gas—553.
City water pressure—60 lb.
Room temperature—74 deg.
Temperature of products of combustion directly at top of heater—168 deg.
Daily average of water used—922 gal.
Peak load 12.15 to 1.15 P. M.—76 gal.
Daily average of people served—1,200.
Operation of Thermostat—
Cuts off gas at 146 deg.
Turns on gas at 138 deg.
Amount of water drawn necessary to operate thermostat—34 gal.
Number of faucets open—one.
Time required—9 min.
Average flow per minute—3.8 gal.
Concluding Results—
Gas consumed per gallon through 86-deg. rise by Instantaneous heater—2.11 cu. ft.
Gas consumed per gallon through 113-deg. rise by storage system uncovered—2.40 cu. ft.
Gas consumed under same conditions when storage system was covered—2.02 cu. ft.
Gas fuel conserved by asbestos covering—16 per cent.

Comparative Data on Coal and Gas Fired Systems

Location—restaurant.
Tank—350 gal. (covered).
Water Consumption—

8 A. M. to 9 A. M.	45 gal. for	1 hr.
9 A. M. to 10 A. M.	135 gal. for	1 hr.
10 A. M. to 11 A. M.	165 gal. for	1 hr.
11 A. M. to 12 M.	195 gal. for	1 hr.
12 M. to 1 P. M.	90 gal. for	1 hr.
1 P. M. to 2 P. M.	173 gal. for	1 hr.
2 P. M. to 3 P. M.	248 gal. for	1 hr.
3 P. M. to 4 P. M.	300 gal. for	1 hr.
4 P. M. to 5 P. M.	143 gal. for	1 hr.
5 P. M. to 8 A. M. next morn.	1,005 gal. for	15 hr. (night load)
Total	2,499 gal. for	24 hr.

Remarks

Peak load for this day was 300 gal., between 3 and 4 P. M. Daily load of 2,500 gal. equals 75,000 gal. per month.

Cost of Operation—Coal

An average of two tons of hard anthracite, egg-size, coal is used a week, or an average of nine tons a month. At $16.30 a ton, this amounts to $146.70. The coal heater requires at least ten minutes attention every hour or four hours a day; at 40 cents an hour this amounts to $1.60 a day, or $48 a month, making a total of $194 a month upkeep on this system.

Note

Coal storage is at the front of the basement, a distance of 120 ft. from the heater. The ashes are kept in a barrel near the heater. Meat-cutting, vegetable-paring and salad-making and other restaurant labor is done in the same room where this installation performs. The conditions as a result of ash dust and coal dust are not sanitary and could be greatly improved by a gas installation.

It is impossible to keep an even temperature of water; the temperature varies from 155 deg. Fahr. (maximum) to 125 deg. during the rush hours.

Cost of Operation—Gas

75,000 gal. at 2.5 cu. ft.—185,500 cu. ft. per month.
187,500 cu. ft. at 70 cents per thousand—$131.25

Conclusion

Gas installation shows a saving of $62.75 per month.

The room where this installation is placed is kept neat and clean; no coal or ash dust.

No fireman is required.

No coal storage space necessary.

Even temperature maintained at all times.

Report of Hot Water Storage System

System consists of 150-gal. storage tank.
Data—before covering with asbestos:

Date	Meter Registration Gas	Water	Consumption Gas	Water	Gas Per. Gal.
12-18-20	57,200	7.956	.....	.....	....
12-19-20	59,200	8,064	2,000	810.0	2.46
12-20-20	61,300	8,169	2,100	787.5	2.66
12-21-20	63,000	8,255	1,700	645.0	2.63
12-22-20	64,900	8,350	1,900	712.5	2.66
12-23-20	66,600	8,445	1,700	712.5	2.38
12-27-20	74,000	8,800	7,400	2,662.5	2.77
12-28-20	76,300	8,911	2,300	832.5	2.76

Average gas per gallon	2.617 cu. ft.
Temperature of inlet water	42 deg.
Temperature at faucet	142 deg.
Temperature rise	100 deg.
Average daily water used	740 gal.

Data—after covered with asbestos:
Covering consists of four-ply air cell blocks, wired in place, finished with half-inch thickness cement felting, and canvas jacket. Connecting lines not covered.

Date	Meters Gas	Water	Consumption Gas	Water	Gas Gal.
1-28-21	134,300	.....	.....	.....	....
1-29-21	136,400	856	2,100	856	2.45
2- 1-21	142,500	3,235	6,100	2,379	2.56
2- 2-21	145,100	4,150	2,600	915	2.84
2- 3-21	147,100	4,960	2,000	810	2.46
2- 7-21	154,900	8,173	7,800	3,213	2.42
2- 8-21	156,300	8,786	1,400	613	2.28
2-10-21	160,200	10,350	3,900	1,564	2.49
2-15-21	169,700	14,414	9,500	4,064	2.33
2-19-21	176,300	17,182	6,600	2,768	2.38

Average gas per gallon	2.467 cu. ft.
Temperature of inlet water	42 deg.
Temperature at faucet	142 deg.
Temperature rise	100 deg.

Observation

Gas consumed per hour—130 cu. ft.

Gas pressure—29.10.

B.t.u. per cubic foot—553.

City water pressure—59 lb.

Room temperature—68 deg.

Temperature of products of combustion above heater and below draft hood—181 deg.

Piping—non-return.

Peak load—84 gal.

Gas fuel conserved by asbestos covering—5 per cent.

Dr. Garner Discusses General Aspects of Natural Gas Industry

(*Continued from page* 438.)

is about 250,000,000 cu. ft. used daily in the Pittsburgh district, or the equivalent of 10,000 tons of coal. The advantages of natural gas as a fuel given were that it is cleaner than any other fuel, more easily controlled, temperatures can be maintained without trouble, and that the amount of labor required for firing is much lower.

In regard to composition of natural gas, Dr. Garner gave three divisions, the gas of the Pennsylvania fields, with a heating value of over 1,000 B.t.u. per cubic foot and containing no air nor carbon dioxide · the California gas, having a high carbon dioxide content, and the Kansas fields, giving some gas containing large amounts of helium.

Under production department, which was named as the department in charge of the leasing of land, locating of wells, building of rigs and drilling the wells, it was pointed out that there were a great many hardships to be undergone by employees of all gas companies in order that there might be a ready supply for the consumer whenever he wants it.

Transportation department was defined as that department in charge of laying of cross-country lines, building of compressor stations and the maintenance of both. Attention was called to operating difficulties such as danger of water in pipe lines, sand and gravel being carried into compressors, necessity of working in rough and wild districts where roads must be built in order to transport heavy machinery.

Distribution department was named as the department in charge of the laying of lines within cities, installation and maintenance of meters and other duties having to do with the sale of gas to the public.

Under growth of the industry, illustrated by means of lantern slides, it was said that at present natural gas is produced in twenty-seven States and sold to two and one-half million consumers.

Extraction of gasoline from natural gas was said to have grown into a very large and important part of the industry. Gasoline extraction declared to be carried on by two methods, known as absorption and compression methods. The compression method is used on wet or casing-head gas (gas in which the gasoline exists in the form of vapor) and three to five gallons of gasoline are extracted per thousand cubic feet of gas treated. This was given as applying to gas from Oklahoma. The absorption method, said to be the most efficient, is used on dry or pipe-line gas and about 150 gallons of gasoline obtained per 1,000,000 cu. ft. of gas treated. The extraction of gasoline from natural gas has increased very rapidly since its start in 1913 until in 1920, 100,000,000 gal. of gasoline were produced from natural gas.

It is claimed that the process does not impair the value of the natural gas, but in reality improves the gas by removing from it some of the hydrocarbons which cause soot, thus making the gas of better quality.

Motion pictures were used to show the drilling of wells, digging and laying of pipe lines and the transportation of pipe and machinery.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	Nov. 10, 1921 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	94½	95½
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	85½	87
Columbia Gas & Elec. Co.	First 5s	May 1, 1945	86½	88
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	101½	102½
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	78	80
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	104	104¼
Consol. Gas Co. of New York	One Year Sec. 8s	Dec. 1, 1921	100	100¼
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	73	75
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	80	82
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	94½	96½
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan 1, 1928	99	102
Hudson County Gas Co.	First 5s	Nov. 1, 1949	77	79
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1943	88½	90
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	98	99½
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	76	78
Milwaukee Gas Light Co.	First 4s	May 1, 1927	83½	85
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	85	86
Pacific Gas & Elec. Co.	Col. Tr. Conv. 7s	May 1, 1925	99	101
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	102½	103½
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	90	92
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	82	82½
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	85	87
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	83	85
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	70	73
Southern California Gas Co.	First 6s	Nov. 1, 1950	87	91
United Gas Improvement Co.	Two Year 8s	Feb. 1, 1923	100	100½
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	80	83
Washington Gas Light Co.	General 5s	Nov. 1, 1960	82½	83½
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	79	82

Commission Approves P. G. E. Stock Issue

San Francisco, Cal.—Approval has been given by the Railroad Commission of the application of the Pacific Gas & Electtric Company to issue and sell at not less than $80 per share, 20,000 shares of 6 per cent cumulative first preferred stock, and to use the proceeds to pay in part actual or estimated construction expenditures.

According to financial exhibits presented by the company, it now has outstanding a total of $103,203,729.66 of stock, made up of $37,452,005 first preferred; $55,800 of original preferred and $65,700,924.66 of common. Of this common stock $31,696,866.66 is held by sudsidiary companies, leaving total stock, both common and preferred, in the hands of the public, $71,511,863.

Construction expenditures up to Aug. 31, 1921, are given by the company at $16,722,522.58, against which there has been received from the sale of securities $15,222,047.70, leaving unreimbursed capital expenditure of $1,500,474.88. Authorized estimated construction expenditures on the company's own system are given at $1,433,648.95, and on the Mount Shasta Power Corporation, all of whose outstanding stock is owned by the Pacific Company, $11,539,312.17. This brings the total of unreimbursed construction expenditures and of the authorized estimated construction expenditures to $14,473,436.60

Investment Note

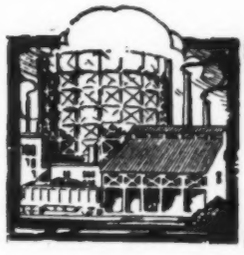
The Peoples Gas Light & Coke Company of Chicago's refunding 5s, due in 1947 and yielding around 7 per cent at their current prices, appear to be selling out of line with certain other bonds of their class. The company's earnings have shown steady growth during recent years and its bond interest always has been earned with a good margin. Its gross earnings have grown from about $18,000,000 to more than $31,000,000 annually in the last four or five years. These bonds are secured by a general mortgage on all the property of the company, which does all the gas business in Chicago and its suburbs. It operates under perpetual franchises. This issue underlies the company's general and refunding 5s of 1963, the mortgage for which provides for the retirement of the refunding 5s and prior liens. These bonds are not callable before their maturity. They were offered originally at 102¼ and have sold as high as 107⅞. Their present price is around 78.

Approve New Schedule for South Portland Gas

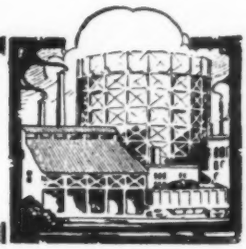
Augusta, Me.—The Public Utilities Commission has rendered a decision approving a new schedule of rate proposed by the Municipal Light & Power Company, which supplies gas in South Portland and Cape Elizabeth. The new schedule, which becomes effective Dec. 1, reduces the price of gas to $2 per thousand cubic feet for the first 10,000 cu. ft. per month, and $1.70 per thousand cubic feet for the next 10,000 cu. ft.

Gas Company Extends Line

Corry, Pa.—The Pennsylvania Gas Company has bought the gas produced by three wells on the Bunnell and Drabneck farms, two miles east of Corry.



NEWS OF THE GAS INDUSTRY



Quality of Gas to Remain Unchanged

Newark, N. J.—Gas in New Jersey will continue to be supplied by the Public Service and other gas companies of the State at the present standard of 525 B.t.u. With this announcement the Board of Public Utility Commissioners concluded the hearings which have been in progress since Newark and Jersey City applied for an increased standard on August 3.

Next to be decided is the rate to be charged by the Public Service Gas Company. Hearings initiated by the board to determine the justness and reasonableness of the present rate of $1.40 a thousand cubic feet will begin Wednesday, Nov. 16, in Newark.

Arguments for cheaper gas are based on the fact that gas oil, the principal ingredient of gas, has dropped in price about 40 per cent; the contention that it takes at least 10 per cent more of the 525 B.t.u. gas to do the work previously done by 600 B.t.u. gas; the fact that the Seaboard By-Products Company, which supplies the Public Service with a considerable proportion of its product, ready made, for distribution, has contracted to furnish gas this year at a lower figure than last, and, finally, the general decline in the prices of all materials used in the manufacture of gas, including coal.

Changes in Pacific G. & E. Office Force

Sonora, Cal.—A number of changes are about to be made in the personnel of the office force of the Pacific Gas & Electric Company in this city.

F. M. Momsen, who has very efficiently managed the company's business in this county since coming here in April, 1920, will be transferred to some other city, in the company's service. To what place has not yet been decided. Mr. and Mrs. Momsen expect to remain in this city for about two weeks longer. They have made many friends in Sonora who regret to see them leave and wish them success in their new home.

Mr. Noack, of Stanislaus, will take Mr. Momsen's position in this city.

P. M. Werry, division superintendent of electric generation, will leave next week for Pitt River, where he has been transferred.

Mr. Taylor will also be transferred, but to what place has not yet been decided.

Mixed Gas to Be Ready About Dec. 15

Buffalo, N. Y.—Arrangements have been made by the Iroquois Natural Gas Company to secure the necessary machinery to provide a mixed gas for Buffalo, but it will be about six weeks, according to estimates given the Public Service Commission during the gas hearing, before installation of this machinery can be accomplished.

The work of providing a mixed gas will be carried out just as quickly as possible.

Mixing the two kinds of gas will mean an addition of 6,000,000 ft. a day to the present supply.

It has been announced that the Public Service Commission's order prohibiting the use of natural gas for fuel in furnaces becomes effective on Nov. 1 and, as in other years, is put into effect to conserve the supply.

Mixed gas will be supplied probably about Dec. 15. Whether this order will remain effective after that date depends upon the gas supply when the mixed gas is delivered and whether it will still be held that mixed gas is natural gas.

Industries Expand

Lansing, Mich.—Reports to the State Utilities Commission indicate that gas and electric light companies in small communities are extending their operations and expanding their plants to meet increased demands. Aggressiveness of local chambers of commerce in procuring industries has caused the demand for more gas and power.

Rochester Gas Rate Lowest

Albany, N. Y.—Rochester is to have the lowest rate for artificial gas of any city in New York State. The Public Service Commission has ordered that the price per thousand cubic feet be placed at $1.10, the service charge abolished and the old minimum rate of 50 cents be restored.

The change in rates, it was estimated, will reduce the revenues of the Rochester Gas & Electric Corporation between $275,000 and $300,000 a year.

A comparative statement of rates now in effect in some of the larger cities of the State, as given by the commission, follows:

New York City, $1.25; Buffalo, $1.45; Syracuse, $1.18; Binghamton, $1.25; Utica, $1.40; Troy, $1.50.

Gas Department Has New Superintendent

Green Bay, Wis.—William F. Miller, superintendent of the gas department of the Wisconsin Public Service Company, has resigned and Leslie P. Ziebell has been named acting superintendent of the department.

Mr. Miller came to Green Bay from St. Joe, Mo., a year and a half ago.

Mr. Ziebell, the new head of the department, has been head of the gas service department for the past two and a half years. Previous to coming to Green Bay, Mr. Ziebell was identified with gas companies at Rhinelander, Wausau and Sheboygan. Mr. Ziebell entered upon his new duties Friday.

Gas Plant Contract Placed

Los Angeles, Cal.—The Bartlett-Hayward Company, of Baltimore, has been adarded a $4,000,000 contract to construct the new gas producing unit for the Los Angeles Gas & Electric Company, John Mason, vice-president of the Baltimore concern, announced in Los Angeles.

Gas Company's Man Tells About Service

A representative of the Harrisburg Gas Company has cited a series of benefits which he says are derived from the convenience of real gas service.

"It is this first-class service that we are endeavoring to furnish twenty-four hours every day and we believe we are succeeding," he said.

"That kind of service means much to the home. It brings:

"Leisure and independence to the American housewife.

"Makes strength and health by eliminating drudgery.

"Makes happy, attractive, contented homes by furnishing cheerful, eye-comforting illumination, quick, intense, heat or steady, dependable warmth.

"Does away with disease-laden smoke, grime, soot, ashes, and fumes.

"Saves linens, draperies, rugs, upholstery, wall paper, furniture and clothes.

"Helps us all to have a pleasanter place in which to live and enjoy the good health that goes with a pure, wholesome atmosphere. A service as intimate as this must need be friendly. Let us deal with it in a friendly way."

England Backs Financing

London, England.—One method of hastening the return to normalcy to Great Britain was reported to the House of Commons when Premier Lloyd George said the Government was considering plans to guarantee interest on capital invested in public utility enterprises. This was the premier's answer to the opposition party which had called upon him to report on the efforts taken to relieve the unemployment crisis which resulted in riots and demonstrations throughout the country.

According to the premier, a resumption of the flow of capital into public utility enterprises would result, which would enable great building in electric, gas, telephone and railway fields employing large numbers of workers, if owners of utility securities were guaranteed interest and dividends.

Smokeless Cities in 20 Years

A gas expert recently predicted that in twenty years American cities will be smokeless and sootless.

The cost of smoke and soot in modern cities is not fully realized. The Mellon Institute reports that from 600 to 2,000 tons of soot to the square mile fall in Pittsburgh every year. It is estimated that the smoke nuisance costs Chicago $50,000,000 annually.

The damage smoke does to household furnishings, curtains, draperies, wall paper and paint is lamented by housewives. It is not generally realized that soot and smoke do great damage to stone structures. The most serious damage suffered from smoke, however, is that done to the health and spirit of the people.

The gas and electric age is here. Why wait twenty years to make cities smokeless when they should be made so now?

Urges Building Funds to Meet Bad Times

New York, N. Y.—If the public utilities could systematically put aside financial reserves in prosperity to be used for construction work and expansion in depression, the recurring periods of business depression might be avoided, or at least greatly decreased, and the consequent unemployment of labor might be much less serious and widespread, according to the statement made here by Edward Eyre Hunt, secretary of the President's Conference on Unemployment in his address before the Society of Industrial Engineers.

"The business cycle," he said, "is marked by peak periods of boom between valleys of depression and unemployment. The peak periods of boom are times of speculation, overexpansion, extravagance in living, relaxation in effort, wasteful expenditures in industry and commerce and consequent destruction of capital. The valleys are marked by business stagnation, unemployment and suffering.

"The most hopeful way to check the losses and misery of depression is therefore to check the feverish extremes of 'prosperity.'

"If our public utilities—electric, gas, street railways and telephones—could put aside surpluses from earnings in times of prosperity for the deliberate purpose of improvement and expansion in times of depressions, we could greatly decrease the depth of depressions. Every encouragement should be given them now to start construction work so as to relieve the situation. It will mean employment to thousands of idle workers if their revenues are sufficient to finance such work."

Will Fix Rate Basis for Power Companies

Oakland, Cal.—Establishment of a permanent rate basis for light and power companies will be taken up by the Railroad Commission when the case of the Great Western Power Company is called Nov. 8 before Commissioner Chester H. Rowell. Hearings for the Pacific Gas & Electric will start Nov. 16. City Attorney Leon Gray of Oakland will represent the city. Other East Bay communities will also be represented. It is expected that the hearings will continue over a period of months. Engineers of the Railroad Commission and of the various cities have conducted an investigation as to the physical value of properties. A hearing for the San Joaquin Light & Power Company will be held Dec. 13. The rate bases for southern California companies have been established.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF AMERICAN GAS JOURNAL.

Published weekly at New York, N. Y., for October 1, 1921.

State of New York, County of New York, ss.: Before me, a notary public in and for the State and county aforesaid, personally appeared Stanton G. Krake, who, having been duly sworn according to law, deposes and says that he is the vice-president and manager of the American Gas Journal, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit;

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—American Gas Light Journal, Inc., 150 Nassau Street, New York, N. Y. Editor—Walter A. Fairservis, 933 President Street, Brooklyn, N. Y. Managing Editor—None. Business Manager—Stanton G. Krake, 468 Greene Avenue, Brooklyn, N. Y.

2. That the owners are: American Gas Light Journal, Inc., 150 Nassau Street, New York, N. Y.; Elbert P. Callender, Pelham Manor, N. Y.; Stanton G. Krake, 468 Greene Avenue, Brooklyn, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Stanton G. Krake,
Vice-President and Manager.

Sworn to and subscribed before me this 10th day of October, 1921.

[Seal] J. Frederich Cryer.
(My commission expires March 30, 1923.)